# The Builder.

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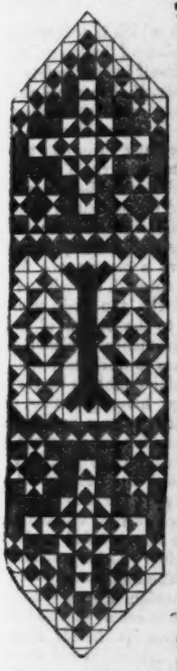
# THE BUILDING EXHIBITION AT THE AGRICULTURAL HALL.



It is, of course, inevitable that the Building Exhibition of one year should present many repetitions of what has been seen in the previous exhibitions. The object of each exhibition is to represent the available materials and methods of building-construction as they are at the moment, and whatever is in use seems to be regarded as having a claim to be represented in the year's exhibition, so as to render it a complete epitome of the subject. Hence there are a good many things which can suggest no remark further than what has been said before about them. With whatever desire to improve, men cannot always be on the stretch of invention, and a thing which is thoroughly good might, in fact, be spoiled by attempts to refine further upon it unnecessarily for the mere sake of change. This year there is even more reason to be impressed with the sense of repetition in some directions, because we have not long since had two exhibitions of sanitary appliances and of grates, a good many of which, the latter especially, meet us again in the Agricultural Hall in the same guise and with the same advertisements and assurances of their peculiar value: and these we can only bow to as old acquaintances and pass on. Of a good many of the exhibits which represent special building materials of proved excellence, also, all that can well be said is that they seem to keep up their quality, and to continue to deserve the reputation they have obtained. There are novelties here and there, however, and there are a good many things which, without being novelties, suggest considerations when we regard them not only from the builder's, but from the architect's, point of view also.

Among the materials in use for the heavier portions of building construction, the one which we are at present looking to with most interest is Concrete. It is possible, in spite of certain drawbacks to concrete buildings as hitherto carried out, that the employment of this material is yet to fill a much larger space in the building of the future than has been at present realised. Comparative cheapness,—which, however, has been exaggerated, and depends, of course, largely on local circumstances; less necessity for skilled labour; durability; fire-resisting, or, we may even say fireproof, qualities,—these are its main recommendations; to which may be added greater impermeability to damp than any equal thickness of stone or brick walling. Its disadvantages are prominent rather from the designer's than from the builder's point of view; disagreeable tone and surface, and intractability in regard to decorative treatment, are the principal drawbacks which the artistic architect feels in dealing with concrete. But in regard to tone, the difficulty has been shown to be capable of being entirely overcome by the simple expedient of mixing colouring matter with the cement. Mr. Lascelles has done this most effectively in his rich red-brick-tinted concrete, and also in some green-tinted concrete, which he exhibited in the shape of a chimneypiece in last year's building exhibition; and so easily may this principle of applying colouring matter to the cement be varied in the formation of different tints, that it is surprising that any concrete builder should give his work the disadvantage of showing nothing but the natural rather dirty-white tone of cement concrete in its normal state. The intractability of the material is not so easily got over. By the use of concrete of very fine grain, Mr. Lascelles and the Eureka Concrete Company can, it is true, exhibit chimneypieces and other such objects, showing a sharpness approaching that of cut stone or brick; but it is only an approach, after all, and it has all the disadvantages which are, in a designer's view, inseparable from cast work of every kind; and the experiments which have been made in this direction, clever as some of them are, seem to show that, in regard to design, concrete must remain a background on which to place other ornament, rather than a substance capable of high-class ornamental treatment in itself. In regard to the practical treatment of concrete, an important step seems to have been made by Mr. H. Faija, whose name is well known as an engineering expert in regard to the use of this material. He brings forward a method of artificially accelerating the hardening of concrete by exposing it to a moist heat of about 100°, and subsequently to a silicious application. Mr. Faija states that by this treatment concrete which was three days old had been found to attain a strength equal to that of many neat cements when a month old, thus shortening greatly the time necessary for warehousing the concrete until it has firmly set, and giving the manufacturer the double advantage of less delay and of saving of space and expense in premises, as not nearly so many things need be warehoused at the same time. At present, as he observes in his circular, the great advantage of cheapness appertaining to concrete goods is largely, and, in many cases, fatally counteracted by the length of time which is necessary to complete an order for any special work. The dated specimens exhibited, some two or three days old, seemed as hard as any concrete could be; it would have been as well, however, to have had duplicate specimens cast at the same time as the others, and not subjected to the indurating process; a more complete and practical comparison could then have been formed as to the extent of the indurating quality of the new process.

There are several good concrete exhibits to be noticed. In those of Mr. Drake the speciality consists in the use of a concrete made of marble fragments, which produces a very agreeable tone and texture, and is susceptible of a considerable amount of polish. The white marble concrete of this class, which is shown in the form of a set of steps, has a most agreeable surface and texture, the two whites of the marble and the cement combining to form a general pearly grey tone. The same exhibitor shows concretes of coloured marble rubble with coloured cement, producing various tones, which, however, have rather too much the appearance of imitation marble. With the white marble concrete this is not the case; it resembles no other material, and has a character of its own. Mr. Lascelles's stand includes some new applications of the red concrete which he has brought into use, which are not all of equal merit to the architectural mind. Among others is "a new kind of wall, built of Potter's slabs, stained to match old stone-work, as used in the wall just completed near the Swiss Cottage Station, which harmonises quite with the old building." Considering that the same eminent and very enterprising builder has already made red concrete walls in imitation of old English tiled walls, we can scarcely expect that after such an æsthetic sin he would not go further in the same direction; but it is to be wished inventors could be made to understand that architects (those who are in their senses at least) do not want imitation materials of this kind. They will be very grateful to Mr. Lascelles and other practical men who will invent for them materials which combine economy of production with sanitary qualities and pleasing appearance; but the last thing architects want is to have such made in mimicry of other materials perfectly different. This is the crying sin of makers of concrete, however, and we have never seen it carried to more absurd lengths than in this exhibition. We cross to the stand of the "Eureka Concrete Company," and there we find fireproof concrete doors of admirable workmanship, and made in thickness no greater than ordinary joiners' doors, showing conclusively the tenacity of the cement employed and the excellence of the manufacture; but these doors are made in precise imitation of a joiner's door, with stiles, panels, and mouldings round them,—a form which, of course, is simply the expression of joiner's con-

struction, and has no sense or meaning of any kind when copied in concrete. If the makers had got any one with a notion of design to make them a suitable design for a concrete door, they might have presented us with something new and pleasing in appearance, as well as satisfactory in construction. They show a model of a stable floor laid with concrete, put down in large slabs; but here again they cannot be satisfied without cutting a considerable portion of the floor into the resemblance of jointed brickwork. A certain breaking up of the surface is necessary to give foot-hold, but it might have been done in a way that would have given an agreeable design to the eye, and not have falsified the construction in so absurd a manner. The very merit which the company claim for their stable-floor is that it is laid down in large blocks, and they proceed diligently to make it look as if it were not. But the crowning absurdity in concrete design is reached in Mr. Tall's house, a two-storied cottage, forming Stand 49, and stated on a large placard to have been designed and put up by Mr. Tall in five days. A very good, and we have no doubt a very cheap piece of work, practically, but in its architectural treatment a conglomeration of shams; the lower portion of the exterior is in imitation of coursed ashlar, the upper portion in imitation of half-timbered work with cross-bracing, and the interior walls in imitation of wood panelling with moulded stiles. If builders are not yet aware that this kind of mimicry work is regarded, by every one who knows what architectural design is, as so much absurd vulgarity, only fit to be laughed at, we must go on telling them so until they do know it.

Among the ornamental employments of concrete the Eureka Company, before mentioned, exhibit a chimney-piece in red concrete, which is creditable for the sharpness of its modelling, comparatively speaking, of course; and Mr. Lascelles has a new application in the shape of a red concrete bath, which looks very well in itself, and is practically suitable, though it may be observed that clean water never looks so attractive as in substances of light and bright tone, such as white marble, which bring out the clearness and sparkle of the water; and the preference for white for the interior of a bath is almost instinctive on this ground. When the water is not quite clean, it is best that this should be distinctly seen, which will not be the case with Mr. Lascelles's red bath. He calls it "a Roman bath," by the way, but the ornament round it and the general form are Greek rather than Roman.

The Belvedere Concrete Company, at a stand in another part of the room, exhibit various bits of statuary in red concrete; but these, of course, are casts, and very deficient in sharpness, and we can see nothing to be gained by exhibiting the application of material to purposes for which it never can be really suitable.

A considerable number of specimens of building stones and granites, rough and dressed, are got together at Stand 70A, by Mr. Trickett, who also illustrates the subject by a small building illustrating various ways of finishing masonry; but there is nothing to call for special comment in regard to this exhibit. We would suggest, however, that a very useful contribution to such an exhibition as this might be made by the arrangement of specimens of building stone, accompanied by brief data, arranged in some systematic and concise form, on cards or otherwise, concerning the weight, chemical composition, strength, &c., of each specimen. Such data are to be got partly from published books, and partly from the experiments of individuals, no doubt, but not from any books that are very popular or accessible; and the tabulating of the materials and their respective qualities, and the work they are fittest for, in a public exhibition, might draw the attention of many who have too much neglected this kind of study of materials. The "silicated stone" exhibited by Messrs. Hodges, Butler, & Dale, is a good material for steps and other things subject to much wear; the surface is not very agreeable in appearance. It is stated to be 25 per cent. cheaper than York stone, and far more durable, and looks as if it were so. But the newer forms of concrete seem likely to supply all that artificial stones can supply, with better and more agreeable tones of colour.

Of the staple building material, as we may still call it, brick, there is a considerable show, but nothing that strikes us as an advance on what has previously been done. We should rather like, in fact, to see more specimens of thoroughly good, sound, plain building brick, with a certain amount of character about it. The unpicturesque character of English ordinary brickwork is to some extent due to the thickness of our bricks; a thinner brick produces a more agreeable-looking wall, though, of course, at the cost of more labour in setting. Bricks in the exhibition seem to run chiefly into more or less ornamental specialities, none of them, as far as we observed, new. There are the glazed bricks of Messrs. Cliff, of Wortley, admirable in surface, but somewhat "loud" in colour; the bricks of Messrs. Ingham, who make in the same neighbourhood, have the same character. Mr. Wood's pressed bricks (Stand 98), in red and buff tones, are agreeable in colour, and very clean and sharp; the ornaments shown are poor in style, as nearly everything of this kind in the exhibition is, artistically speaking. Occasionally are to be seen specimens of brick in which colour alone seems to be the object,—fashionable reds are to be produced, and so long as the colour is the right thing the brick may be as sandy and loose in texture as you please: against these we protest. We want to see more of the class of hard metallic-ringing brick, with a surface like iron,—a sort of building material which it it is difficult to get hold of now, so much is brickwork running after fancy effects of colour instead of quality. At the stand of one exhibitor we observed a wall in process of building, with very pronounced red bricks and white pointing, carefully raised to or above the level of the brickwork: another foolish fashion, in which the production of a prim neatness of effect (not destined to last long) is substituted for the workmanlike and scientific use of mortar. Under the head of bricks we may mention one speciality, exhibited by Mr. White, of Abergavenny, who proposes to do wonders with the "Hygeian Rock Building Composition" (the patentee evidently thinks there is something in a name). With this composition, the constituents of which, of course, are a secret, he proposes an improved method of building walls so as to render them damp-proof, and to increase their strength. This is by building a 9-in. wall, for example, as two 4½-in. walls, with a space of about an inch between them, which is filled up with the composition in question, which penetrates into the joints and hardens and forms the tie between the two thicknesses of brickwork, besides interposing a stratum of material impervious to wet between the inner and outer thickness of brickwork. The illustrations given of the damp-proof qualities and of the tenacity of the composition appeared satisfactory, but we should prefer to have a thorough bond in the brickwork, in a wall of any height.

Of stoneware and terra-cotta there are the usual exhibits,—nothing out of the way. Messrs. Doulton occupy the centre of the hall, with a compact stand, containing a great variety of objects, in which the sanitary element is more predominant than is usual in their work, regard being had, we presume, to the practical character of the exhibition. A detailed examination of these and other pieces of sanitary mechanism in the exhibition would be better attempted as a separate subject, as no examination of such productions can be of any value without going minutely into their details. It may be added that the exhibition was in a very half-finished state on the first day, and the working of many of these things could not be illustrated. Messrs. Doulton include, however, objects of art in their collection, the central one being a drinking-fountain, to be erected outside St. Jude's Church, Whitechapel, the gift to the neighbourhood of Mrs. Barnett, the vicar's wife, and carried out by Messrs. Doulton from the designs of Mr. H. H. Statham. It is worth observing that the Street Drinking Fountains Association, who undertake to keep in repair and to supply with water fountains erected in accordance with their requirements, had refused to sanction anything but granite, asserting that every other material became worn out, and had to be replaced before long. Fortunately they accepted the assurances of competent authorities that the far more tractable Doulton ware was probably even less destructible than granite; and if they will act on this information in other cases we have a chance of seeing fountains of more variety and attractiveness of form and colour put up by the Association, at no increased expense, in place of the singularly bald and uninteresting granite design which they at present seem to adopt as their badge.

Among the other principal exhibitors of terra-cotta and cognate materials are Messrs. Stiff & Sons, whose sanitary pottery, as it may be called, is as good as work of the kind could be in execution. From an artistic point of view the productions exhibited by Messrs. Willcock & Co., of Burmantofts, are among the most admirable work of the class that could be seen. Their glazed bricks of various designs are mostly in excellent taste, and really splendid in richness of colour and texture; nothing more effective in its way could be put into the architect's hands as a means of constructive polychromy. Some other exhibitors would do well, even in their own interests, to take account of the value of getting work of this class designed by those who know how to design detail. Messrs. Stanley, of Nuneaton, for example, exhibit exceedingly good practical work in the way of tiles and air-bricks, and other things included under the general term of "glazed goods"; but their attempts at ornamental work are feeble to a degree. A glazed terra-cotta box for window plants, in the shape of imitation of rustic woodwork, is a kind of thing that, under the present condition of public taste, ought hardly to be exhibited at all; though it is no worse in taste, perhaps, than some of the imitative concrete work to which we have already referred.

Among the practical work which is concerned with the fitting and finishing of buildings, an ingenious novelty presents itself in the "safety" window-sash exhibited by Mr. R. Adams (Stand No. 1), the safety spoken of being for the cleaner of the window. The sash in outward appearance is an ordinary double-hung sash, but the turn of a key inserted into a keyhole in the vertical bar of the sash enables it to be released from the groove and turned on its centre, so as to be cleaned from the inside. Both sashes can be turned on their centres, and slid up to the top of the window, to leave a clear space for getting in heavy furniture through the window-space when required, and the top sash, when turned, can be slid down to the bottom of the sash-frame for greater convenience in cleaning. The model exhibited appears to work very well, and this is an invention which ought to be very useful in the case of large hanging sashes, a portion of the necessary fittings of a building in which there is much room for improvement. The lifting sash window is the principle generally preferred in this country, and has decisive advantages which will probably always recommend it, but on a large scale it is awkward to handle, and anything that tends to improve and render more convenient its practical working should have due attention. Amid the immense number of fittings of every kind which are exhibited, in regard to many of which it seems impossible to say that one man's work is better than another's, the value of the exhibition will consist in the extent to which actually new and improved ways of surmounting difficulties are brought forward; and it should be the object of judges to look for and specially distinguish these. The mere exhibition of what has been done for some time past, though it may, as we have said, be necessary to complete the exhibition as illustrating the present state of work, is of little importance in comparison with the invention of new processes which are really improvements on what has hitherto been used, or which appear sufficiently like improvements to demand consideration as to the advisability of their general adoption; and it would render the exhibition of more real and direct utility if manufacturers, without necessarily abstaining from exhibiting specimens of their staple work, would place prominently any contrivances for which a new principle or a new application is claimed, so that these can be easily singled out from the mass of things which have no such claim. In some cases this is done very decisively; but if these cases represent the only novelties, there is not very much of new application in the department of fittings, at all events. Among things which, though not exactly new, have come very little into use, may be mentioned Russell's "Binate" door-knob, exhibited by Messrs. Archibald Smith & Stevens, which is an absolute security against the constant annoyance from door-furniture working loose and coming off, the outside and inside handles forming one solid piece. In other cases we find articles exhibited which represent the usual make of the thing as it has been carried on for a long time past, in which the fact of the exhibition serves chiefly to show that no improvement has been attempted where it might very well have been looked for. Messrs. Warner, the eminent bell-founders, for

instance, exhibit a bell and its hangings, in the south gallery. Most of us know how a bell is hung; but what we should have liked to know from Messrs. Warner, or any other bell-founder who should appear in such an exhibition, is, whether they could devise no improvement, for example, on the clumsy and unscientific method of stopping the bell when it has been swung over its centre, by a stay simply screwed on to the bell-stock at one end and striking a sliding bar with the free end. Even if the principle be the best, the stay should be secured in a more workmanlike manner, and made in a form better calculated to resist the strain and leverage on the stay, which, with a large bell in full swing, must be very considerable. We should be curious to know how often, in the annals of bell-ringing, a stay shaped and fixed in this way has worked loose and given way in ringing; an accident which might have very serious consequences to the ringer, as a heavy bell with a large wheel might wind him up to the ceiling before he could let the rope go. If Messrs. Warner will exhibit a bell with an improved stay next year, that looks as if was meant for its work, or a bell-catch on an improved principle, it will be more to the purpose than sending an article which serves to show with what clumsy mechanism eminent bell-founders are content. The quality of their bells, of course, we are not here impugning; but that is rather a musical than a building question.

Though the main objects of such an exhibition as this are and should be practical, we find a considerable proportion of exhibits the object of which is to show different methods of decoration and decorative effect. Some of the best of these call for no special remark, as they only exhibit afresh, and in no essentially different form, the qualities which their exhibitors have already displayed here and elsewhere. The Linerusta-Walton material is displayed in as good form as it was last year,—an admirable material, illustrated in very tasteful designs. The stand of Messrs. Jeffery & Co. exhibits wall-papers which are nearly all of good design, and admirably executed. To go into criticism of work on purely artistic grounds, in any detail, would, however, be out of place in speaking of an exhibition of this kind, further than that we wish to discredit that which pretends to art only in a false and vulgar spirit. The main point is to consider how far the materials offered for purely decorative purposes are suitable practically, and in some senses æsthetically, for those purposes, how far their adoption is to be encouraged or otherwise. For example, we notice a stand of excellent work in scagliola, by Messrs. Bellman & Ivey, and we are bound to consider whether this success in scagliola is a sin or a virtue, from an architectural point of view. Messrs. Bellman & Ivey, we observe, are beforehand with us, and scout our criticism in advance. "N.B.," they say indignantly in the catalogue, "Scagliola is *not* a surface imitation, but a thoroughly artistic material, taking a high *natural* polish similar to marble." The emphatic italics are their own. We might puzzle the makers by asking them to define what they mean by "an artistic material"; at any rate, they forget the important distinction, that marble can play a genuine part in construction and scagliola cannot, but, when used as columns, only pretends to do so; and that when used as a wall decoration with no assumption of construction, its value arises entirely from the fact that it imitates marble, which is a finer and more costly material, and therefore produces on a hasty inspection an idea of costliness and luxury without really involving proportionate cost. No one would have invented scagliola except with that object; it is used because people would like to have marble and cannot afford it; it is a sham even in that sense. It is so still more when it is used in the way the makers say is their "speciality," for "surrounding iron or brick cores, without showing joint," because it there professes to play a constructive part in building which it cannot play. If people will have scagliola, they will get it very good from Messrs. Bellman & Ivey, but no remonstrances on the part of those who are commercially interested in scagliola will recommend it to any one who has a true sense of architectural fitness and propriety. It has had its day, but the time is past for it now. Papier-mâché is a material which is largely illustrated in the productions of "The Papier-Mâché Company." In many of its applications this is a material unobjectionable, in so far that it is not imitative of anything else, and is a more stable and lasting medium for cast ornament than plaster; though, as a material capable of advantageous use only for mechanically produced ornament, it can only take a secondary place; and much of the ornament produced in it is of the type that may be called "gim-crack," an expression that would apply to many of the things exhibited by the company. But the "fatal facility" of modern stamping and casting machinery has tempted the makers into imitation work here too, and we have a wooden Gothic screen with what, at a first glance, look like carved bands of foliage, which are, in fact, stamped papier-mâché inserted, and coloured as nearly like the wood as may be. Fortunately (or unfortunately, as we choose to regard it), the different texture of the material refuses to be entirely disguised, and betrays itself, to the disgust of the discreet critic. Messrs. Jackson, the well-known papier-mâché modellers, exhibit some fibrous plaster ceilings, which have the practical merit of being capable of being put up in sections of several feet square, as they are shown at the exhibition, so that they can be worked at the shop and put up in their place with the design complete. The designs are good and tasteful.

Messrs. Cliff, whose bricks we mentioned before, have endeavoured to revive Della Robbia ware (Della *Robia*, it is erroneously spelt in the catalogue), and they have got something like the look of the thing, but their specimens are too tame in style. The work of Della Robbia and his followers, where it is purely decorative and does not deal with figures, is considerably open to criticism as being too realistic, but is redeemed by its remarkable freedom and boldness of style: the imitations at the exhibition seem to have got the realism without the boldness; a study of the spirit of original examples might enable the designers to remedy this. The use of Linoleum as a surface for painted decoration is shown in Messrs. Miller, Little, & Co.'s stand; the rough texture of the material is remarkably good for this purpose, and gives a peculiar and rich character to the colouring. In regard to the question of tone of surface in coloured decoration, the Silicate Paint Company's exhibit is an agreeable contrast to the shiny tone of ordinary oil painting, and has this dead and flat quality to recommend it, as well as its sanitary recommendations over oil paint. Coloured decoration of another kind is shown in the wood stains of Mr. H. C. Stephens; these are announced as preparations for dyeing wood in imitation of oak, mahogany, &c. If the patentee had only let the imitation notion alone, and recommended them as rich and durable colours for producing decorative design on the surface of woodwork, they might have our cordial approbation; the tones are very rich, and very suitable for producing conventional design on wood surface. The "Pliable Wood Company" exhibit another means of finishing wood-surfaces, by what is really an exceedingly thin veneer, so thin as to be as pliable as paper, and capable of application to the contours of mouldings as well as to flat surfaces. In their exhibited specimens they have made the mistake, however, of imitating parquetry; and the process, though ingenious, is open to whatever æsthetic objection may be made to ordinary veneer, with the additional drawback that it is more fragile and less lasting. Of parquetry itself there is a good exhibition by Mr. Henry Bassant, good both in execution and in the character of the designs, which adhere strictly to what is suitable to this method of decoration. The decorations exhibited by the Papyrotile Company, and the embossed leather papers, in Japanese style, of Messrs. Hindley & Sons, are very good specimens of decorative material; the former we noticed in a previous exhibition. The embossed leather might be used with effect in other styles besides imitation Japanese.

In the large number of chimney-pieces exhibited by various firms, we cannot but be struck with the contrast between the fine material and good work and the very small amount of what can be called good design. In the marble chimney-pieces there is really scarcely any. There is a good deal of what is meant for effective design, but it shows no evidence of being produced by artistic hands. The best exceptions in this respect are some of the moulded and carved wooden chimney-pieces exhibited by Messrs. Steel & Garland. These are not only of excellent workmanship, but in some cases exhibit very good design, the better for being simple and unpretentious. Marble chimneypieces seem to be produced mostly in a very commercial spirit, and it is difficult, if not impossible, to procure anything from the stock of even the best firms which would satisfy a cultivated taste.

It is impossible to pass by so much costly and what is evidently intended to be decorative work of this class without a glance at its artistic pretensions, though we return to the position that art, as usually understood, is not the object of such an Exhibition, and that, so far as it touches on materials which are chiefly valuable from the designer's point of view, the genuine object is to show what materials are available for artistic effect, for the benefit of those who know how to use and combine them. It may be said that this is best shown by exhibiting specimens of their artistic treatment. If this view be adopted, the exhibitors, in their own best interests, should endeavour to procure the co-operation of competent designers, instead of merely making a big show of a quantity of weak and often bad design, turned out in the ordinary practice of their firm. Apart from the mere exhibition of materials in their crude state (which in itself is useful to professional and practical men, but not so interesting, of course, to the general mass of visitors), the higher object of such an exhibition should be to show the best way of doing everything in regard to materials, workmanship, and principles of construction; and then some good designs may be superadded to show the whole in the best light, if the objects are such as to come under the domain of decorative work. But, then, in such a case it should be the best class of design; anything less than this makes the thing a shop-window exhibition. The artistic and the practical treatment of materials in many cases touch each other very closely, if we accept Mill's comprehensive definition, that "all art is the endeavour after the perfection of execution." He adds that a workman has worked in the spirit of an artist when his work shows that he desired perfection in it for the sake of perfection, even when a less complete treatment would have answered the practical purpose as well. There is work in the exhibition which comes fairly under this definition: there is a good deal which does not. There is too much of quantity and too little of quality; too much of the effort to advertise by making a great show. The Exhibition would be worth more, and would take a higher stand, if there were less of this mere wholesale display of wares, if many of the firms which exhibit were to restrict their articles more in regard to number, and aim rather at showing a model specimen of the best type of work of each class which they can produce. Things could be better seen, examined, and estimated at their true value, in that case. As it is, in a considerable proportion of the exhibition we seem to see, not the effort to do a thing in the best manner possible, but the effort to exhibit in the most effective manner the way "our firm" do it, whether it be really the best way or not. In this respect there is room for improvement, and for a higher standpoint to be taken in future exhibitions.

It would be better on another occasion, as the exhibition is not open for long, to aim at having it really ready on the first day. As a matter of fact, the opening day was a scene of dust, dirt, and confusion, things being in process of setting-up and finishing whichever way one turned. On the other hand, we must commend, as we have done on former occasions, the systematic arrangement and numbering of the stands, and the equally systematic arrangement of the catalogue, which renders it easy to find whatever is wanted.

Having made these general observations, we proceed to mention *seriatim* the principal exhibits, at the cost of some little amount of repetition.

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THE third annual Building Exhibition was opened on Monday at noon, although, as is usually the case, a large number of the exhibitors had not all their goods in position until late in the evening, and several had to complete their stands on Tuesday. The exhibition is larger than that of last year, a portion of the goods displayed having to be located in the south gallery, a visit to which will repay the trouble of ascending the stairs. Taken as a whole, the exhibition fully maintains, and even surpasses, last year's standard of excellence. Bacon's aphorism that "houses are built to live in, not to look on," has been often quoted to the disparagement of those architects (if any such there be who are deserving of the name)

who would sacrifice the internal comfort and convenience of a house to mere external display. It is not too much to say that in the exhibition now open at Islington is to be seen every requisite appliance and material necessary to make, in the hands of an architect,—i.e., in the hands of a man who knows how to plan and how to design,—a house not only fit to "live in," but, to say the least, tolerable to "look on," this happy combination being quite possible of attainment while giving due regard to economy. When the public at large begin to know in what good building consists, the days of "jerry" building will be numbered, and architects will find (as they should do) increased employment in designing and superintending the erection of the houses of the people. As an educational agency in this direction, the present Building Exhibition is well worthy of being (as we trust it will be) largely visited by the general public, while those practically engaged in the various branches of the building trades cannot but derive some amount of instruction from a visit. At any rate, it will serve to "post up" the men belonging to particular branches in what is being done in other branches,—a matter of no small importance in view of that interdependence and co-operation so necessary to produce a good building. Without further preface, we now proceed to notice in detail some of the typical classes of exhibits.

### I.—BUILDING MATERIALS.

*Bricks, Tiles, Terra-Cotta, &c.*—The display in this section is much larger than last year, several fresh exhibitors having put in an appearance. Some were not quite in position on the occasion of our visit, and others whose names are in the catalogue were not to be seen as we passed through, though we have no doubt by this time they occupy their allotted stands. It is necessary to say this much, for, if scant notice appears of some deserving exhibitors, the neglect is not on our part, and where no mention occurs in our report of certain firms, recognition must be looked for in a supplementary or unavoidably postponed notice.

A handsome display by Doulton & Co., Lambeth Pottery, occupies the central stand in the hall, and the exhibits are multifarious. Apart from the glazed sanitary ware exhibited, this well-known firm shows bosses and architectural decorations in "Doulton Ware," glazed and unglazed bricks, encaustic tiles, Staffordshire blue paving-tiles, stoneware string-courses, window dressings, cornices, terra-cotta and wood mantelpieces, and a great variety of their ware adapted to sundry ornamental and useful purposes. The ware, as a whole, shows excellence in finish.

Messrs. Stiff & Son (Bay 20), London Pottery, Lambeth, have also this year a large and attractive display of terra-cotta, red and buff, including cornices, string-courses, balustrades, window-heads, pedestals, vases, air-bricks, sanitary stoneware of all kinds, all evidencing good manufacture. For excellence of firing and sharpness of modelling the architectural terra-cotta exhibited by this firm includes some of the best work which we have ever seen in this line.

Messrs. Cliff & Sons (Bay 23), Wortley, Leeds, and King's-cross, N., besides their glazed and sanitary ware, exhibit an excellent assortment of brick and tile ware, including various specimens of paving and fire-clay goods. Their glazed bricks are well moulded and sound, and comprise plain and ornamental specimens of various colours. This stand is worthy of notice for some new specimens of ornamental terra-cotta and glazed stone ware, square and columnar, and, indeed, of various shapes for as varied uses. Mr. John Mathews (Bay 24), Royal Potteries, Weston-super-Mare, exhibits Poole's patent square-cornered bonding-roll roofing-tiles, with a collection of terra-cotta, statuary, vases, and rustic and floral designs, generally commendable.

Messrs. Smith & Co. (Bay 25), Canal Potteries, Old Kent-road, have on view a very good assortment of terra-cotta chimney-tops, terminals, and other ornamental finishings, including glazed stoneware garden-edging, invert blocks for bottoms of sewers, kitchen-sinks, drain-pipes, damp proof-course bricks, and kindred articles in connexion with sewers and drain construction.

The Paragon Brick and Tile Company, Rugby (Stand 83), have a fair display of machine-made bricks, ornamental and plain and of different colours. The "Paragon" bay windows are put forth as a speciality, the bricks being made from specially-prepared clay, for which a hardness "more durable than stone" is claimed. Stanley Brothers, Midland Tile Works, Nuneaton (Stand 66), show blue clay goods, red and buff terra-cotta, fine clay and glazed goods, with patent-malt tiles and air-bricks. Messrs. Engert & Rolfe, Barchester-street, Poplar, (Stand 87), show a speciality in the form of a stand with brickwork set in a cistern of water. This is intended to show the mode of application and utility of fibrous asphalte as an anti-damp course in walls. Though not exactly belonging to this section, it may be added they have on view a good display of roofing felt, isodorous bitumen felt, sacking, hair, and other useful felts. Mr. Thomas Lawrence, Bracknell, Berks (Stand 89), shows good specimens of tiling and brickwork, including a red brick column, illustrating plain workmanship, and a roof displaying his system of tiling. The specimens of gauged brickwork and carving in bricks are commendable. Messrs. Williams & Nash, Castle-street, Holborn (Stand 95), exhibit tile hearths, in addition to their marble chimney-pieces and fenders, noticed elsewhere. Messrs. Ellis, Partridge, & Co., builders' merchants, Leicester (Stand 96), exhibit a fair assortment of red, blue, and white facings, and other bricks, quarries, &c. On a small roof the roofing slates and tiles are shown in position. Mr. Charles Wood, Shirland-road, Paddington (Stand 98), has a good assortment of red and white pressed bricks, plain and moulded, Staffordshire blue goods, and terra-cotta ware.

Mr. J. E. Ellison, ventilating engineer, Leeds (Stand 99), besides exhibits belonging to another section, displays several specimens of his conically perforated bricks and air-grates in various colours and sizes, patent conical ventilators and "radiator" ventilators, in oak and iron. The Marland Brick and Clay Works, Torrington, North Devon (Stand 100), have on view white, buff, terra-cotta facing bricks and vitrified bricks. Their other exhibits include grooved pavings, architectural terra-cotta, and samples of the raw clay from which the above are produced. The Bracknell Pottery Brick and Tile Company, Bracknell, and Nine Elms, S.W. (Stand 5) exhibit a varied collection of red and white facing and moulded bricks, red and white rubbers, pressed Roman and other plain and ornamental roofing and ridge tiles. Both the plain and ornamental tiles evidence good handling, and the same may be said generally of all the exhibits, including the agricultural drain-pipes. Phillips's Patent Lock-Jaw Tile Company, Newport, Monmouthshire (Stand 36), exhibits a speciality in tiles, from which the company derives its odd name. The lock-jaw tile is said to be snow-proof, wind-proof, rain-proof, and above proof in other ways (with 150 to the square). There are glazed and plain specimens, and a roof is exhibited covered with these peculiar lock-jaw patterns. Carefully laid, they would appear to offer advantages, but time will testify as to their holdfast qualities. The tiles are, however, worthy of examination. Frictionless screw tile-making presses are also shown, fitted with fly-wheel and planed sliders, adapted to the manufacture of the brick and tile-ware shown. Messrs. J. White & Co., Worship-street, E.C. (Stand 70), have on view an assortment of plain and moulded bricks, paving-bricks, tiles, including roofing-tiles, ridges, finials, chimney-pots, pavements, dados, hearths, and sanitary pipes. The goods are worthy of commendation generally. Messrs. Wilcock & Co., Burmantofts, Leeds (Stand 71), have on view a very fine assortment of glazed bricks, faïence, and terra-cotta, with sanitary apparatus. The stand is attractive, and the goods evidence careful manufacture. The display exceeds in excellence that of last year.

The Hartshill Brick and Tile Company, Stoke-on-Trent (Stand 16), show floor-tiles of various sizes, and roofing-tiles of various colours, finials, terminals, and blue vitrified paving and building bricks. Messrs. F. Rosher & Co., Blackfriars (Stand 154), show a good and varied display of different kinds of bricks, plain and ornamental, roofing and ridging tiles, and specimens of window arches and doorways in sets, ready for application. Mr. William White, Abergavenny (Stand 157), exhibits brick walls constructed in two thicknesses, with a small space left between, into which a composition is poured in a liquid state. This "Hygeian Rock Building Composition" (White's Patent) binds the two thicknesses, greatly increasing their strength, and rendering the walls damp-proof. A weight of 8 cwt. is suspended from the centre of a beam, of the brickwork, supported girder-fashion, to show the strength of the work cemented by this composition. It is claimed that a 9-in. wall treated with this cementing material will be stronger than a 14-in. wall built in the ordinary manner. There are also exhibited in this stand specimens of water-tanks put together with this composition. The novelty is worthy of examination, the tests being apparently of a satisfying kind,—at least, on a cursory inspection. Messrs. Marsh & R. J. Smith, Bridge-street, Blackfriars (Stand 5, South Gallery), show a fair assortment of bricks and tiles, being representatives of various manufacturing companies.

Messrs. Ashton & Green, St. Mary Axe, E.C. (Stand 69), in addition to their other numerous exhibits, noticed in another section, display a very good assortment of drain-pipes, terra cotta, chimney-pots, slates, cisterns, bricks, cement, together with permanent green slates, as used at the New Law Courts, and other excellent goods. Webb's Worcester Tileries Company, Limited (Stand 53) show a large and varied display of all sorts of geometric, mosaic, and encaustic tiles. Included are printed tiles for walls, ceilings, furniture, also printed under-glaze hearth and other tiles. This is an attractive stand, with its adjunct, where are shown specimens of wood decoration in blocks or slabs. The Finsbury Park Brick Manufacturing Company (Stand 127) exhibit some commendable specimens of their red facing bricks, also pressed, malm, and stock bricks. A wire-cut machine is also shown by the Company. The Madeley Wood Company Brick and Tile Works, Ironbridge, Shropshire (Stand 143), have on view a very fair assortment of pressed roofing tiles, finials, gutters, and hips, together with buff facing bricks, squares, and other facings and finishings. The forms and patterns are generally well moulded, and show sound manufacture. The collections of brick and tile work, &c., which we have passed under notice are very varied, and, speaking generally, as a whole the exhibitors in this year's exposition have displayed good manufacture.

*Stones, Marble, Granite, and Artificial Stone.*—There are not many exhibitors of natural building stones detached or embodied in building construction, apart from marble and marble ornamental objects. Some of the exhibitors of last year are absent, but their places appear to have been supplied by an increase in the number of the exhibitors of artificial stones and concrete material. Among the exhibitors of specimens of natural building stones is Mr. S. Trickett, Victoria Wharf, Millwall, whose display this year exceeds that of last, both in detached specimens and in embodied workmanship. On this stand (103A) may be seen numerous varieties of building stones, limestones, sandstones, and granite, rough, dressed, or highly polished. There is a good assortment also of granite pitchings, kerbs, macadam, &c. In embodied building construction an office is shown with shaped quoins, door-jambs, window moulded work, the central portion of the masonry work being rubble, executed in Yorkshire grit or freestone. This specimen is well executed, and is entitled to recognition. The Mangotsfield Pennant Stone Company, Staple Hill, Bristol (Stand 133), exhibit monumental headstones, pillars, steps, paving for street work, and samples of crossing stones for same. Messrs. A. McLean & Co., Belvedere-road, Lambeth (Stand 138), in addition to cements, exhibit chimney-pieces manufactured in stone cement, and various specimens of mouldings in coarse and superfine qualities. The specimens are cleverly turned out, and evidence good workmanship. S. & E. Ransome & Co., Essex-street, Strand (Stand 139), besides their indurating solution, now well known for curing damp walls, exhibit numerous specimens of artificial stone for various building, ornamental, and sanitary purposes. The list includes filtering-slabs, sinks, tanks, gratings, ventilators, free-grit grindstones, and artificial stone adapted to a variety of useful and ornamental wants. The display is large and attractive. Messrs. R. Thornton & Co., Stone Wharf, Nine Elms (Stand 157 b) show a large block of Portland stone from the firm's quarries, Portland Island, Dorset. The Patent Victoria Stone Company, Kingsland-road, E. (Stand 159) have several good specimens of their artificial stone on view, including paving, platform coping, steps, and sinks. Messrs. Bellmann & Ivey, Wigmore-street, W. (Stand 74), show a very fine

and attractive display of scagliola marble for columns, pilasters, dados, architraves, wall-linings, and various forms of interior decoration. Among the examples are specimens of already executed designs in various public buildings throughout the kingdom. A speciality here illustrated is the surrounding of iron or brick cores with scagliola without showing joint.

*Iron.*—Messrs. Steven Bros., & Co., Upper Thames-street (Stand 45), among their various other exhibits, noticed in another section, have on view several specimens of ornamental iron work, of good design. These exhibits include spiral and straight staircases, balusters, newel bars, altar-rails, balconies, brackets, railings, ridgings, terminals, and vanes. Constructional ironwork is shown of various forms, and for as many uses, and the specimens on view are very good as pieces of iron workmanship. Messrs. Treggon & Co., York Works, Brewery-road, N., and Jewin-street, E.C. (Stand 60), exhibit sundry specimens of galvanised iron roofing, dormers, cisterns, tanks, builders' buckets, and much plain and ornamental galvanised iron and zinc articles in connexion with house construction and building wants. Messrs. Ransome & Co., whose other exhibits are noticed elsewhere, have on view an assortment of building tackle and scaffolding appliances, worthy of attention. The scaffolding appliances of the Rettie Patent Seat and Scaffold Fastener Company, Bush-lane, Cannon-street (Stand 142), are worthy of notice, and will be looked at with interest. A piece or length of scaffolding is erected to afford an illustration. The scaffold-fastener is formed of two chains, one end having a tongue and the other a loop to slip over the same. The tongue-piece is provided with slots, and so arranged as to allow for varying girths of poles. To secure or bind the poles, the chain is passed round the same, and the loop end is slipped over the tongue until it is nearly tight. A flat wedge is then inserted at the back of the loop into one of the slots in the tongue, and driven down, tightening the chain. The whole process is very quickly effected, and is far more simple to the practical eye than any description can be. This fastening appliance ought to come into use under certain limits. The Rettie patent seat is also very simple in construction. By a combination of a couple of levers the rapid turning of the seat is accomplished, to a horizontal or vertical position at will. Where space is an object at times, in hotels, shops, and in other situations, the patent seat will be found serviceable.

### II.—CONCRETE BUILDING.

*Monolithic Systems, Blocks, Slabs, and Apparatus.*—There are accession of strength and increased interest evidenced in this department of the present exhibition. Mr. W. H. Lascelles, Bunhill-row (Stand 153), not only holds his own, but enlarges on his former doings in concrete construction. Here are plain and moulded concrete forms of all varieties in building and ornamentation. The list includes window-sills, transoms, door-jambs, gables, walls built of Potter's slabs, examples of concrete ceilings, specimens of work executed from the designs of well-known architects, all handled with skill. A new kind of wall-building in concrete shows panelled slabs and concrete backings screwed to stud work. An instance of its use may be seen in the church gables and tower built in Highbury Quadrant. Mr. Lascelles also shows, among other exhibits, good examples of concrete chimneypieces, in the Jacobean, Queen Anne, and Early Georgian Domestic styles. The woodwork objects will be noticed elsewhere. This stand will well repay a visit on the part of both professional and ordinary observers. Messrs. Charles Drake & Co., Railway Wharf, Battersea (Stand 103), have an attractive display of objects in concrete materials. Among others, are marble concrete baths, window-heads, copings, terminals, steps, fire-proof floors, doors, staircases, wall tiles, and a great number of other ornamental and useful building forms. This firm also exhibit a concrete building apparatus. The dovetailed self-fixing building slabs, and the marble and granite facing bricks, are worthy of notice. The display as a whole is very good. The Eureka Concrete Company, Queen's-buildings, Queen Victoria-street (Bay 26), have on view a great variety of concrete steps, sills, strings, balusters, fire-proof floors, mantelpieces, thresholds, copings, &c. The concrete four-panelled door, hung in position and in action, fitted with lock, &c., will surprise many visitors.

Mr. Henry Faija, C.E., Great Queen-street, Westminster (Stand 157A), presents some good samples of concrete hardened by the exhibitor's new patent process. Samples of concrete only two days old show considerable hardness. The process is very well worthy of attention. Mr. J. Tall, Lordship-lane, Dulwich (Stand 49), illustrates concrete construction by a portion of a cottage. The other exhibits are indestructible door and window frames, drawings of concrete villas, and concrete building apparatus. Messrs. Hodges, Butler, & Dale, Thames Silicated Stone Works, Bridge-street, Westminster, and Greenwich (Stand 50), exhibit numerous specimens of "Imperial Stone" coping, window-sills, steps, coal-plate stones, silicated stone sewers, and water-pipes, with other applications of artificial stone. The assortment is varied and good. There are some other exhibitors probably, but they were not in position on the occasion of our visit, and some of those who may be omitted in this section will be found under artificial stones in another place. We have had some difficulty in finding the stands of several exhibitors, who, owing to their late application for space, had to be stationed, some in the galleries, and others distant from their former positions and kindred exhibitors.

### III.—WOOD-WORKING MACHINERY AND BUILDERS' PLANT.

Although some of last year's exhibitors in this section have not put in an appearance this time, still their places have been supplied by others, and, on the whole, the display is a good one, and includes a large number of efficient machines, and some with improvements. Messrs. F. W. Reynolds & Co., Acorn Works, Blackfriars-road, S.E. (Stand 152), present, as usual, several excellent wood-workers, and converters. The assortment includes sawing, planing, moulding, mortising, and tenoning machines. The new speciality of the firm is a panel-planing and improved thicknessing and moulding machine. The improved trying-up, thicknessing, and moulding operator possesses the advantage that all the processes can be performed on the one combined machine, without removal to the table of a separate operator. The remainder of the machines include saw-benches, bandsaw-machines, vertical-saw frames, and converters, driven by steam-power, with others suitable for hand-power. The machines are efficient in action, and, as specimens of engineer's work, are characterised by a good finish. One of the firm's own steam-engines supplies the motive-power to the other machines.

Messrs. W. Æ. Smith & Co., Ashburnham-road, Chelsea (Stand 151), exhibit a large number of the usual description of wood-workers, including a few with improvements. One of these, worthy of notice, is an improved four-cutter moulding and planing machine. The advantage here is that the four sides of the scantling for the intended moulding are operated on at the one time. A moulding, 6 in. by 3 in., can be turned out finished. There is a variable feed motion and counter-shaft complete. The combined joiner's saw and vertical spindle moulding machine comprises an irregular moulding and shaping machine for curvilinear work. There is also shown, among several other machines, a rebating, grooving, tonguing, mortising, tenoning, cross-cutting, bevel-cutting, and ripping saw-bench, with suitable fences and adjustments for convertible operations.

Messrs. Charles Powis & Son, Gracechurch-street, E.C., and Millwall-pier (Stand 150), show their patent and general joiners, and the "Universal," for planing, moulding, sawing, tenoning, mortising, &c., for which a gold medal was awarded. The assortment includes a variety of efficient operators, including saw-benches, band-saw machines, vertical moulding ditto, and improved timber-frame. This timber-frame is adjusted to saw logs up to 16 in., and fitted with deal-cutting apparatus to cut two deals, 16 in. by 4 in. A horizontal steam-engine, with governors and pumps, 10-horse-power, and an 8-horse-power improved portable steam-engine, with recent improvements, are on view.

Messrs. Henry Warr & Co. (late Warr & Lewis), engineers, Blomfield-street, London-wall (Stand 149), exhibit a selection of wood-working machines, including mortising, tenoning, boring, and panel-planing operators. The latter is provided with top cutter block, and also with side cutters, thus performing three operations, or rather doing three sides at one operation. This firm also exhibits three of the "Ord" patent gas-engines.

Mr. E. S. Hindley, Bourton, Dorset (Stand 148), in addition to his very good and simple horizontal and vertical engines and boilers, shows a number of saw-benches, some intended for steam and others for hand-power. There are five varieties of circular saw-benches exhibited, some with band-saw apparatus complete, for either steam or hand-power. The Standard Emery Wheel Company, Greek-street, Soho (Stand 147), exhibit a number of machines, which, though not wood-workers, more or less come under the denomination of builders' plant. Among these are patent saw-sharpeners, "ring" grinders, "race" and "vacuum" grinders, portable fan forges, lever treadle and rotary. These latter articles are compact in shape, and will be found useful for general blacksmiths' work, and sundry kindred trade purposes. There are also on view solid emery wheels, and a patent mixing machine for kneading any plastic material, such as putty, cement, mortar, &c. Messrs. Lewis & Lewis, engineers, Cambridge Heath-road, E., and Cannon-street, E.C. (Bay 18), show a number of good wood-working machines, comprising mortising, band-sawing, and rounding machines for shaping curtain-poles or other cylindrical forms. There is a useful improved circular saw-bench, for hand-power, including one 15-in. circular saw; the feed is self-acting. The band-sawing machines are noticeable, and one has two saws, and is adapted to be worked by the foot. Among other exhibits are a combined engine and mortar-mill, improved friction hoist for raising building materials, and a new patent gas-engine for small powers. The latter appears to be simple and efficient, as well as economical within the range of its powers. "The Builders' Co-operative Machinery Company (Limited)," St. Mary-axe, E.C. (Bay 17), display a number of wood-workers, some of which are noticeable. The assortment includes specimens of different makers. The list includes "General" and "Universal" Joiners, steam and hand-power band-sawing machines, wood-planing and moulding operators, self-feeding saw-benches, and band-saw machines. Messrs. George Wilson & Son, Victoria Machinery Works, Leeds (Bay 16), besides their lock and latch exhibits, display a number of wood-workers, with other building plant and machinery. The No. 2 patent centre-motion mortising-machine is put forward as a speciality. This machine complete has six chisels, two drillers, and two screw-keys. The "Rack Mortising Machine" is fitted with eight chisels, three drillers, and two screw-keys. A combined circular and band-saw bench, with two saws, and a band-sawing machine with one saw, screw-key, and steam pulley are also shown. Among the other plant are efficient slate-boring and punching machines, flooring and bench cramps, and a Venetian blind-lath punching machine. Mr. C. D. Monninger, Clerkenwell-road, E.C. (Stand 52), has on view a large assortment of frame-saws, deal webs, pit-saws, cross cuts, and band-saws. Band-saws are shown from ½ in. to 6 in. in width, and circular saws from 2 in. to 60 in. The other exhibits include saw-sharpening machines, lathes, emery-wheels, belting-tires for band-saw pulleys, lubricators, engine packing, and a number of joiners' tools. The display is attractive and varied. In our notice of the sundry exhibitors of machines in this section, we are obliged to be brief in our details, as it is impossible, from the wide field covered, to devote space to elaborate description. The working capacity, action, and characteristics of several of the machines of the wood-working kind enumerated above were treated in a special paper in these columns last year, and to some extent it relieves us of the necessity of going so soon over the same ground. We may, however, shortly return to the subject again in review of the latest improvements in wood-working machinery.

### IV.—JOINERY AND WOODWORK.

*Doors, Sashes, and General Joinery.*—Some of the old exhibitors in this department are again forward, but there are absent friends as we write who may or may not turn up before the close of the present week. Among those in position, and partly in position, are the annexed exhibits. Messrs. Esdaile & Co., Wenlock-basin, City-road (Stand 32), show, as usual, a good and varied display of doors and mouldings of English manufacture, and also Swedish mouldings and trellis work, and doors of Swedish and American make. There are also on view some good machine-made plasterers' laths, pulley blocks, with and without iron bind-

ing, for building and kindred uses. The doors and mouldings are of various sizes, and finished joinery work is cleanly turned out of hand. In an adjunct to this stand specimens of what is called "pliable wood decoration" are shown. The term might be better chosen, as cuttings or thin veneers about the thickness of ordinary shavings form the pliable covering or decoration for laying on or wrapping around other wood. A number of cylindrical pieces of red or other deal can be skilfully veneered with this pliable decorative veneer, and the specimens on view, showing wood of various fancy kinds, are well executed. Messrs. H. Atkinson & Co., Wharf-road, N. (Stand 25, South Gallery), display a good assortment of doors, sashes, mouldings, skirtings, and general joinery work. A speciality in connexion with this stand was to be a Swedish wooden or timber house; but it was not in position on the occasion of our visit, though hourly expected. Mr. W. H. Lascelles, already mentioned in a preceding section, exhibits several fine specimens of joinery work in old domestic styles, included deeply-moulded sashes, doors, architraves, pedestals, &c., all solidly put together and highly finished. There are also on view specimens of solid and ornamental joinery work in the form of a length of handrail apparently intended for the circuit of a well-hole on a level landing, and a fine specimen of cylindrical sprandrel framing, well panelled and moulded. The joinery specimens briefly mentioned are worthy of examination for the skilful handicraft they exhibit. Messrs. Vernon & Ewens, Westminster Chambers and Cheltenham (Stand 132), exhibit this year some excellent specimens of panelled doors, including an oak seven-panelled door, a vestibule door in pitch-pine, drawing and bed room doors, all of which evidence good handling. The Queen Anne porch and door designed for Bedford Park by Mr. E. J. May, architect, are specimens of joinery work in the mode peculiar to the locality. The exhibits as a whole are good and well selected. Messrs. J. Eberhard & Co., Edward-street, Hampstead-road, N. (Stand 44), have on view several fine specimens of parquet flooring, applicable to various floors, whether of stone, concrete, or wood. This firm also show door and dado panelling, newels, balusters, handrails, &c., all commendable for good workmanship and finish. Messrs. Gillow & Co., Oxford-street (Stand in South Gallery) exhibit an attractive display of parquetry work, together with some cabinet, office, and domestic furniture and fittings. The parquetry examples are exceedingly good, and entitled to recognition.

*Shop Fronts, Fittings, and Show-cases.*—We miss the attractive stand that Mr. Frederick Sage, of Gray's-inn-road, usually presented. In this line there are none in this year's exhibition who display the attractive varieties of show-cases and shop furniture and fittings that characterised Mr. Sage's last year's show. Messrs. Thomas Hogben & Co., of Appold-street, E.C. (Stand 54A), have on view a number of shop-fittings and air-tight show-cases, which, though limited in range, are commendable.

Mr. Henry Bassant, Wells-street, Oxford-street, W. (Stand 59), shows various specimens of excellent parquet dadoing of different designs. On this stand will also be found several fine examples of parquet flooring in fancy woods, including satinwood, mahogany, sycamore, rosewood, and walnut. Some rich designs in teak-wood are also shown. Messrs. H. Webb & Co., Worcester (Stand 53A), exhibit what is termed "Webb's Patent Diachromatised Wood Blocks or Slabs." The pattern here runs through the substance, for flooring and wall purposes. Another patent embraces a method of decorating plank-wise wood for sundry kinds of panelling, wall dados, furniture inlays, and other ornamental uses. The "Plank-wise Decoration," it may not be amiss to add, are exhibited here for the first time. The methods used are suggestive of other adaptations and processes.

### V.—SANITARY APPLIANCES AND FITTINGS.

*Warming and Ventilation.*—Messrs. Joseph Cliff & Sons, of Wortley, show some attractive-looking glazed fire-clay stoves, suitable for use in show-rooms, conservatories, halls, school-rooms, &c. It is claimed for them that they are cheap, cleanly, and healthy. Messrs. Doulton's "Lambeth" radiating tile stoves are very meritorious on the grounds of economy, effectiveness, cleanliness, and beauty of appearance. We are not surprised to hear that they are being largely used, and the qualities we have named as appertaining to them, as well as the small amount of attention which they require, cannot fail to ensure for them a good future. For halls, show-rooms, studios, and for many other situations, they are admirably adapted. Mr. Wm. Stobbs, of Queen Victoria-street, shows the "Crystal Heater," an American stove for burning coke or anthracite, and very suitable for use in halls for the warming of the air in staircases. The "Kyrle" grate, also shown by Mr. Stobbs, and made by the Coalbrookdale Company, is worthy of attention. It is constructed for burning anthracite. Messrs. Ashton & Green, of St. Mary Axe, have an admirable variety of slow combustion and other grates. One of their specialities is the patent "Harleston" ventilating grate. Another is the "Cambridge" grate. Both of these are eminently worthy of attention on the grounds of efficiency and economy. This firm's slow-combustion hall stove, specially adapted for burning anthracite, though it will burn ordinary coal with a small amount of smoke, is also well worthy of attention. Messrs. Steel & Garland, of Wharncliffe Works, Sheffield, and Holborn Viaduct, again make a good display of good things in the way of slow-combustion and other grates, all characterised by excellence of design and finish. Messrs. Steven Bros., of Glasgow and Upper Thames-street, show (Stand 45) an excellent variety of slow-combustion, "Queen Anne," and other stoves and grates. Messrs. Wells & Co., of Shoreditch, make a large display of stoves and grates. Messrs. Deane & Co., of King William-street, London Bridge (Stand 121), exhibit Crane's patent register-stove, for burning anthracite or ordinary coal. It has before been noticed by us with commendation. The Coalbrookdale Company (Stand 38) are exhibitors of register-grates and dog-grates, including the "Iron-bridge Controlled Combustion Grate." They are all characterised by great excellence of workmanship. Messrs. F. W. Reynolds & Co., of Southwark (Bay 4), are exhibitors of slow combustion and other stoves, including some good and cheap tiled registers. Messrs. Clark, Bunnett, & Co., show the "Kaio-Kapnos" stove, for the burning of coke, anthracite, or common coal. It is the invention of Mr. Ingram, an architect (we believe). It is so constructed that, under proper management, it will almost, if not entirely, consume its own smoke. It can be made with a chamber at the back, into which the external air can be warmed before being admitted into the apartment. The "Westminster" slow combustion grate is shown by Messrs. Steven Bros. (Stand 45). Mr. William Addis (Stand 45) exhibits the "Waverley" and "Melrose" slow-combustion grates, and Messrs. Archibald Smith & Stevens (Bay 13A) show the "Wonderful" self-feeding grate.

Messrs. Robert Boyle & Sons have a good representative display of their well-known self-acting air-pump ventilators, which have been largely used, and, as there is good testimony to show, with satisfactory results. A great merit which they possess is that they have no movable parts. It is unnecessary, however, that we should describe them in detail, but we may add that, being fixtures, they can be designed for situations in which they are exposed to view, with external casings or coverings in the form of a turret or *flèche* of architectural character, so as to add to rather than detract from the appearance of a building. This firm's chimney-cowl is also worthy of attention. Dr. Hall's patent ventilator is shown by Mr. Bostel, of Brighton, at Stand 122. Messrs. Ewart & Son, of Euston-road, are exhibitors of the "Empress" ventilator, which we have spoken of on former occasions. Messrs. C. Kite & Co. (Stand 10) show their exhaust roof-ventilators, of the great merits of which we have spoken on previous occasions. The Sanitary Engineering and Ventilating Company, Victoria-street (Stand 112), exhibit their "Imperial" self-acting exhaust ventilators, the "Imperial" ventilating tubes, a chimney-exhaust, and other useful appliances connected with ventilation.

*Water-closets.*—Messrs. John Bolding & Sons, of South Molton-street, are exhibitors of some admirable water-closets, one of the best and most serviceable being their "Simplex" self-trapping over-flow valve closet, in which the overflow is carried to the back of the valve (where it is impossible for any solid matter to enter it), and by connecting the overflow with the supply-pipe (above the valve) the trap of the overflow is flushed each time the closet is used, without interfering with the pan supply. Banner's patent closet, all the parts of which are in white earthenware, and which is a modified but highly-improved form of pan-closet, is also shown by these exhibitors. In this closet the basin and pan are instantaneously removable, allowing of their rapid and thorough cleansing on both sides, as well as enabling the interior of the earthenware container to be thoroughly cleansed. A pan-closet of the ordinary form, but with an earthenware container, is also shown, as well as good hopper and wash-out closets. Messrs. Doulton & Co. are also, it is needless to say, exhibitors of some very good water-closets, including the "Lambeth" valve-closet, trapless and "wash-out" closets, and the "Lambeth" pan-closet, which is an improved form of that type of closet, with a strong stone-ware container provided with a ventilating-pipe. Mr. Bostel's Brighton "Excelsior" closet (Stand 122) continues in demand, and deservedly so, for, as we have stated on other occasions, it is very good and simple. Cross's patent "trough water-closet," so named by the exhibitor (Stand 106), is hardly a correct description, for instead of the usual trough, a number of hoppers or basins of stoneware are mounted upon a horizontal pipe. The flushing action is automatic, and the hoppers are kept charged with water, the discharge being capable of being regulated to take place at greater or less intervals. Messrs. Hayward, Tyler, & Co., of White-cross-street (Bay 16A), exhibit their "full-flush valveless closet," together with their patent flushing arrangement. These appliances possess some very good points, not the least of which are simplicity and cleanliness, even though complying with the restrictions of the water companies. Messrs. Smeaton, of Theobald's-road; Messrs. John Warner & Sons; Messrs. T. & W. Farmiloe, of Westminster; and others, are also exhibitors of water-closets. The ever-inventive Mr. Lascelles, of Bunhill-row, shows a new patent earth-closet, which has a revolving wheel or chamber containing three compartments. This wheel revolves paddle-wheel wise, and has on one side of it a hopper for holding the earth, the pit for receiving the contents of each compartment as it is used and discharged being on the other side. It appears to be simple in construction, and unlikely to get out of order.

*Laminated Lead* for lining damp walls is shown by Messrs. Quirk, Barton, & Co. (Stand 24). It will be found very useful in some situations, as it can be papered over.*

## SOCIETY OF LADY ARTISTS.

As on previous occasions, the works hung in the Great Marlborough-street Gallery (746 in number) include many good and charming pictures, and may be safely recommended for a visit. Our chief lady-artists, however, still absent themselves, preferring to take their chance with the men at the Royal Academy and elsewhere; and it can scarcely be said that there is much change or advance in the general character of the collection. The place of honour must be given to 262, "London Bridge," by Clara Montalba, a characteristic specimen of that clever lady's art. "Sunny Moments" (228), by Charlotte J. Weekes, is another picture that will attract attention, as also should Mrs. Cooper's excellent case of miniatures (697). The artist has been fortunate in her subjects. Mrs. Marrable, as usual, sends a number of pleasing landscapes, foremost among which we must place (97) "Palm Trees and Fruit Sellers." Miss Rayner's old towers and buildings are always worth looking at, and are so specially on the present occasion. "Evangeline" (85), Mrs. Champion; "Cathedral, Cefalu" (102), M. C. Wratislaw; "Pompeian Villa" (128), Emma Jennings; "Morning after Rain" (146), M. F. Kempson; "An Arab Chieftain" (165), Florence Reason; "Feast of Roses" (192), Mrs. Barnard; "Trespassing," Mrs. Whitlaw; "A Breath of Spring," Mrs. Alma Tadema (247); "Evening in North Germany" (282), Fanny Assenbaum; "Breakfast in Bed" (309), Louise Jopling; "The Old Gooseberry Garden," Mrs. Paul Naftel (388); "Waiting" (588), Madame Giampietri; "Otford Church" (644), Mrs. Val. Bromley; "Dear Lady Disdain" (655), Mrs. William Barnard; several frames of flowers by Mrs. Lukis de Guerin, have all good marks against them in our catalogue. Miss Edith Marrable, and some of the other younger members, are making good progress.

* Continued on page 370.

## THE PHYSIOGNOMY OF MOTION.

THE observations in our last number on animal action in nature and art anticipated a communication on the subject of Mr. Muybridge's lecture from a frequent contributor to our pages, who has on former occasions called attention to the utility of the camera in furnishing lines of limitation within which the artist must work, in order to be truthful. We are not about to retrace the view of the subject, in which we are glad to find that the opinions of our contributor are quite in accordance with those which we have recently expressed. But it is well to call pointed attention to the fact, that while it does not follow that the effect at which the artist aims is to be secured by the delineation of a position momentarily assumed by a moving figure (especially if it be one of critical mechanical importance), it is at all events certain that the representation of an attitude outside of the series, so to speak, of successive positions, must be wrong. The painter must, because he is a painter and not a photographer, conventionalise. But he must conventionalise truly. Thus the rule, to which we have before called attention, that either the ear or the nose of a horse is, in almost any natural position of the animal, in advance of his fore-legs (which is verified by the recent photographs) is one which the artist can only neglect at the peril of the criticism of nature herself.

We fear, however, that those artists who, taking advantage of the information secured for them by the camera, for the next ten or fifteen years, try to draw horses as they actually move, must expect that same kind of condemnation from the public at large which was bestowed on an unpopular actor, who dared to compete with a favourite of the day in imitating the squeaking of a pig. The old favourite was applauded to the echo,—the new man was hissed and howled at, as in no way giving the true effect of the voice of a pig. And yet it was a real pig, concealed beneath the actor's cloak, whose voice was thus condemned as un-piglike.

As to the horse, then, Mr. Muybridge has only confirmed observations which we have long ago ventured to print. But is there not something further to be asked of the new method? In this case an expected result (expected, at least, by one or two artists) has been obtained. How about *l'imprévu*? Are there no further surprises in store for us? We venture to think that there may be. The human figure has been studied much more generally, and probably more exactly, than any animal type. We do not deny (though we are not aware that it is a fact) that great artists may have made equally accurate studies of the osteology of the horse. But we know what has been the care devoted to human anatomy. Raffaelle and Michelangelo were accustomed (as we are well aware) to sketch their most important figures in the skeleton, to build the muscles upon the bony platform, and, last of all, to throw the drapery around the figure. We can cite the instance of the figure of Christ in the cartoon of the miraculous draught of fishes, of which studies in these distinct stages exist. Anatomical models by Michelangelo are to be seen at South Kensington. We are thus fully prepared to admit that the proportions of the human subject, the articulation of the limbs, and the play of the muscles, are so familiar to the real student, that there is small excuse for bad drawing of the human figure. Then, again, we have the great advantage that the study of the nude is now easily within the reach of the student in this country. We are not sure how far any of the admitted authorities of the day will agree with our views here, which we, therefore, state with due modesty. But they are to this effect, and they are not formulated without definite experience. Half an hour of the study,—what shall we say?—half a minute,—of the natural and unconscious nude, is worth a week of studio work, not for attaining accuracy of touch, but for grasping *motif*. A glance at the free grace and motion of the red Indian, at the perfect elegance of,—we will not say the surprised, but,—the espied bather, on the shores of Italian waters, gives a *motif* which can never be forgotten by the artist, and which no amount of study of a paid model could ever equal. In the same way we venture to think,—but as to this we are less confident,—not only that the study of the nude model is far more important for the young artist than the most accurate study of the skeleton; but further, that it is possible that a better educational effect may, perhaps, be produced by the exclusive study of the live figure. That, however, we only suggest. We are inclined to believe it to be the case, but are by no means prepared to defend the view with any vigour if attacked. But what we are coming to is this.

Every man, woman, or child has what we may call a distinct physiognomy of motion. It is as characteristic as the physiognomy of form. The swing of the elbow, the toss of the head, the pride of the neck, the swan-like undulation, the firm martial stride, or the hesitating shuffle of the gait, each of these, to the accurate observer, gives an indication of the person as sure as that afforded by the features, and often recognisable at a greater distance than the traits of the face. What has the portrait-painter done to represent the physiognomy of motion? Have not some of our first artists,—we cite from memory Lawrence and Wilkie,—used "live lay-figures" to complete the portrait, of which the face only was drawn from the real sitter? And if any particular trait or trick of posture or of manner be attempted, is not the result generally a caricature? We could cite instances, but it is unnecessary. On the other hand, in the children of Millais, we see something of the physiognomy of motion. The idea is never absent in the works of Hogarth. But it is extremely rare as a general rule.

Here, then, we think the camera may come in as a means of instruction in figure-drawing. At all events, the subject is worth consideration. The course that we should suggest would be to take a series of instantaneous photographs of subjects remarkable for their movement, such as a graceful dancer, a firm and sturdy soldier, a timid and embarrassed young person of either sex, an unconscious child. Let a series of sun pictures be taken of each of them, so that, if required, they may be combined into motion by the instrument with the hard name. Let the set of views, and each view separately, be compared with a drawing of the same subject made independently by the artist. If the result of this comparison be not instructive, not to say surprising, we shall have made a suggestion in vain. If it be shown, on the other hand, that the portrait-painter has, in indicating the physiognomy of motion, held the mirror up to nature, it will be well to acknowledge the fact, and to do honour to the triumph.

The study of these serial photographs goes far to explain that want of *something* which is so painfully perceptible in most photographic portraits. The procedures of art are now more rapid than is the ordinary sense of vision. Time, we know, is required by the eye for the perception of a distinct impression. Were it otherwise external nature would appear to us as if seen through a series of rapid winks. It is the slow appreciation of the eye which combines a number of points into one flowing nerve. The study of this part of the subject is extremely subtle. But all the more likely is art to be benefited by its careful pursuit. To a certain school reproduction of nature is the aim of art. To another, and, we think, a nobler, school, art is the embodiment of the ideal of the artist, based, indeed, upon the facts of nature, but informed with a soul that elevates the mere outer form. This view of art is, we think, irresistibly supported by the facts now brought before our attention. What may be optically true is not, necessarily, pictorially true. On the other hand, what is optically false is, necessarily, pictorially false. Those who only see a paradox in this statement will hardly be prepared to accept the true benefit offered to them by the use of the camera, which is much the same,—to illustrate it from another department of thought,—as is that of *Mémoires pour servir* to the historian. The artist is taught by the camera what to avoid as impossible. The field is thus delineated, within which, not by the reflection of a moment's truth, but by such a combination of successive and linked positions as would occur in a space of time long enough to form a distinct picture on the eye as is possible only to the artist, the proper effect will be produced on the spectator.

We may add, that on the 17th current, Captain Abney, R.E., whose mastery of the camera is so well known, threw upon the screen at the Royal Institution photographs of spectra said to be taken in some small number of the millionth parts of a second. His object was, as he told his hearers, that Mr. Muybridge, whose presence among the audience he observed, should not return to America with the statement that we are behind our transatlantic cousins in the art of photography. We can only say that if the intelligence can be convinced of the accuracy of such a measure of speed, the imagination refuses to conceive it.

## POMPEIAN WALL DECORATIONS.

AMONG the remains of ancient art found at Pompeii, there are few, if any, which surpass in interest or value the wall-paintings and decorations there discovered in such abundance. Upon these precious relics of antiquity an important work has just appeared under the auspices of the German Archæological Institute. The author of the work in question is Herr A. Mau, who has spent a long period at Pompeii in the study of the mural decorations, and the treatise which he has just published is spoken of in the highest terms by the best judges in Germany. Herr A. Furtwängler, who is himself contemplating a monograph of his own on the same subject, greatly praises the publication of Herr Mau, who has succeeded in classifying the Pompeian wall-paintings as belonging to several distinct epochs.

At the first superficial view all these paintings appear alike, but when they are studied and compared it becomes evident that there are essential differences between them. It soon appears that there are at least two distinct and leading groups, the heavier imitating real architecture, and the lighter consisting of fanciful decorations. It is strange that down to the most recent times none of the numerous observers of these works have paid any attention to these marked differences. Even those *savants* who have made a professed study of Pompeian paintings and architecture appear to have had no idea what a treasure had been preserved to us in the mere decorations of the walls. It is Herr A. Mau's merit to have been the first duly to discern and appreciate their value, and to distinguish the differences marking the decorations belonging to different periods. His "History of the Decorative Wall Paintings at Pompeii" is accompanied by an atlas or portfolio containing twenty plates, which reproduce in an excellent style of art, a number of the most characteristic of the actual wall-paintings found in the excavated city. These illustrations, in colouring and execution, are exact copies in water-colours of the originals, and are themselves models of what such reproductions should be. The artist who has executed them is Herr Likkard, and he has succeeded in producing a series of works of art which will be as welcome to the art connoisseur as to the archæologist and student. Herr Furtwängler says that many a reader, when he turns over the twenty sheets in this portfolio, will ask in astonishment, "Can these things really have been in Pompeii?" Most who have paid any attention to the subject have been accustomed only to see the more glaring and extravagant decorations belonging to the last period of the city. Publications hitherto have been almost confined to the paintings of this period, which was a period of retrogression and decay. The specimens given by Mau and Likkard carry us into the older epochs of the city, and give us works not only brilliantly executed, but showing that the ancient artists spent a minute and loving care upon their work. The wealth of "motives" in these older decorations is astonishing. Doubtless, since Pompeii was dug out of its hiding-place, many of this class of paintings have perished unnoticed, as, indeed, it is to be feared is the fate in store for all these works sooner or later.

Herr Mau shows that the wall paintings of Pompeii are distinguishable into three great epochs, followed by the final or fourth period, which was one of decay. The works discovered permit us to follow step by step a perfectly regular and uninterrupted course of development extending from at least the beginning of the first century before Christ, down to the destruction of the city. First comes the serious, stiff, and stately "Incrustation Style." Here is no picture, no ornament. Nothing but the stucco imitation of the variegated blocks and slabs of marble meets the eye on all the walls. Pictorial representation is nowhere seen except in the mosaics on the floor. This prim style of decoration belongs to the period of the great palaces of the Oscan aristocracy, and of the large tufa portals and columns with their nice arrangements. The period when this fashion flourished was the second century before Christ. It was about 80 B.C. that it gave place to the so-called architectural style. This style began by representations in mere colour. It reproduced

in painting those variegated blocks and cornices which had previously been given plastically in stucco. Soon, however, it advanced to representations of architecture of constantly-increasing richness and boldness. The effect of greater space and longer distances was aimed at, and hence columns are represented in front of the walls. Low walls are depicted with views of distant rooms or vistas extending to the open air. Sometimes the walls open sidewards, affording the view of an entire street, while occasionally through a gable-crowned frame in the middle of the wall an outlook is presented over the more or less distant landscape, and its moving and changing figures. In this way large pictorial representations were by degrees suggested as decorations for walls. On the other hand, into the architectural style of decoration, which had more or less the appearance of reality, purely decorative elements gradually began to find their way. Reality and possibility began to be more and more disregarded and departed from, and decorations become more and more fanciful and imaginary. Many portions of walls thus become filled with what has no pretension to reality, but what is purely ornamental. Thus by degrees, about the commencement of the Christian era, the third, or so-called Ornamental Style of Decoration developed itself. The architectonic division of the walls is kept as in the preceding stage, but all appearance of reality is given up, and rich surface ornamentation takes the place of the more realistic imitative plastic work. Nevertheless, the style thus arrived at is not purely ornamental decoration, but the real contrast between the general architectonic groundwork and the superficial ornamentation is concealed by the fanciful execution of the latter, which makes the architectonic element look like mere ornament. In their minute delicacy and care of execution the walls painted in this style excel all others. At the same time they are very liable to degenerate into what is trivial. The final period is after 50 A.D., and the very numerous paintings belonging to this period strongly contrast with those of the earlier stages. In ornaments and in the treatment of the architectural parts they bear considerable resemblance to the bold and splendid works of the Second Period, but exaggerate its effects to excess. The prospects shown by side openings are here the rule; but in the wild confusion of columns, flights of steps, terraces, and so on, the idea of any representation of reality entirely disappears. While the Third Style tended towards a true and sincere ornamental surface decoration, we meet here with an undisciplined fancy and the abortions it gives rise to. This style introduces no new principle.

The sketch here given of the course of development of the different styles is traced in all its details by Herr Mau. The times and dates assigned are chiefly derived from the inscriptions (*sgraffiti*) scratched on the walls. The question whence the different styles of decoration were introduced to Pompeii, Herr Mau does not attempt to answer. It is certain that they were not originally produced in that city itself. They are found in Rome, but also in other places. In Brescia, in Catania, in Sicily, on the island of Capri, there are found remains of wall decorations entirely corresponding with those of Pompeii. Even in the North, in Vienne in France, and at Treves in Germany, they have likewise been discovered. There is, therefore, ground to believe that the styles exhibited in Pompeii prevailed contemporaneously throughout the Roman empire. Were they then invented in Rome? Or did a purely Greek development of wall painting precede that which we know took place in the Roman empire? Herr Furtwängler negatives this question. The Roman decoration was something new. Nothing similar had preceded it. The development in the Roman empire is complete in itself. Its peculiarity is that it unites pictorial representation and ornament, and makes them one. All preceding wall painting, both that of the Egyptians and of the Assyrians, as well as of the Greeks, before Alexander was either purely ornamental or purely pictorial. The former was by far the less important of the two. It was also quite dependent on textile art, whose products it imitated. And it imitated them probably only because it afforded a cheap substitute for the real carpets usually hung up against the walls by the ancients. Regular wall painting among the ancient nations mentioned, however, was purely pictorial and indeed represented figures. Every one knows the decorations of Egyptian temples and tombs, and of the Assyrian palaces. The like is seen on Etruscan tombs and with Polygnotus and his school in Greece. It is remarkable that the Middle Ages present a similar phenomenon. It was only the Renaissance which created a wall decoration resting on the union or amalgamation of the representation of figures or architectural subjects with pure ornament. The Renaissance was, however, led to this only from the discovery of remains of ancient Roman wall decorations. The architectonic element in the ancient wall decoration springs from the so-called first style. And this latter itself probably originated in the capitals of the Greek kings. There is an example of the imitation of this style in stucco preserved in the case of Pergamon, which must date at least as far back as the beginning of the second century before Christ. It may also be assumed, in Herr Furtwängler's opinion, that the second or Architectural Style of decoration likewise originated in one of the centres of Greek civilisation. At the time when this style first appeared, about 100 B.C., the only style of art prevailing was the Greek. But this second style corresponds entirely with the pictures with which the Pergamon excavations have presented us of the sculpture of that epoch,—a bold, strong, almost savage spirit with a perfect mastery over, and prodigal application of, the artistic capital collected in the preceding epoch. Indeed, the forms and heads on the walls of that style with their wings, snakes, pointed ears, and horns, transformed into ornaments, remind us often in the most striking manner of the strange and extraordinary shapes of the giants of the Pergamon sculptures. The pictures of those walls were partly explained by Greek distichs, and point more clearly than any others to a Greek origin. The originating centre of this style appears to have been Alexandria, which was the headquarters for painting as Pergamon was for the plastic art in the Hellenistic epoch. This second style was, together with the Hellenistic sculptures, the last real creation of Greek art. Afterwards there came over this field a certain falling off. The savage, passionate, and excited element was avoided. Older models were sought out again, and the gentle, ornamental, and elegant came into fashion. Here, too, Alexandria appears to have taken the lead, but it was no longer Greek Alexandria. It was now subject to Augustus Cæsar; a provincial city of the Roman Empire. It is even not improbable that that ruler's personal influence may have had no little to do in determining the development of this style. But it remains probable that the style was started in Egypt, because all its ornaments are modifications of Egyptian models. In it we often find friezes with obviously Egyptian figures and animals with characteristic Egyptian impress; but besides these there is a whole series of small ornaments evidently drawn from Egyptian models. It is also an important fact, though not noticed by Herr Mau, that it is only textile ornaments, and indeed carpets, that are imitated in the "Third Style." This carpet style never pleased the Western eye. The Oriental flat decoration was not worked out to perfection in the West till the Byzantine influence had been felt. Of the "Third Style" the ancients appear soon to have become tired. Neither did the exact, correct, choice taste of Nero's time please men any longer. The reaction that set in led to to the so-called "Fourth Style" so abundantly represented at Pompeii. This appears partly like a return to the rougher Greek style, only it is freely adapted to Roman taste. That which has been preserved in the way of wall-painting from the later Imperial times in addition to those of Pompeii, shows that the taste simply went further in this same direction, and therewith a steady decline and decay.

## HEATING AND VENTILATING THE HOME OF THE SCHOOL BOARD.

A CONSIDERABLE sum of money has been spent in warming and ventilating the Board Room in the building on the Thames Embankment, but yet the members say, with Mr. Toole, "they are not happy." They are not warm enough on cold days, and suffer greatly from draughts. It may be remembered that when we went over the building to look at the arrangements we expressed our belief that they would be found insufficient. The complaints have been so loud at recent meetings that further steps have been resolved upon.

## A FEW MORE WORDS AS TO THE ELECTRIC EXHIBITION.

THERE were, as we hinted in our last number, one or two exhibits at Sydenham to which we had no space then to refer, but as to which it would be just neither to the exhibitors nor to our readers to be altogether silent. We are now referring to Classes XII. and XIII.

First among these we desire to call attention to No. 300. This is an electric alarm and register of the fluctuation of water-level, by T. R. Brailsford, which, it is stated, is adopted by the Conservators of the Thames at all locks on the river. Our main object in calling attention to it is with reference to the plan which we some time back proposed for the protection of the low-lying districts of London from inundation, by telegraphic warning of the height attained by the river at Sheerness, on those days on which inundation is possible. We are not prepared to pronounce any decided opinion on Mr. Brailsford's method, as to which it will be desirable to have the verdict of the Conservators of the Thames. But in the interest of the poor inhabitants of the low-lying area, who have so repeatedly and so severely suffered from the unwatched rise of the Thames, we desire to call the urgent attention of all concerned to the mode of electric warning.

In fact, it would not have been a bad idea to establish a special class for those applications of electricity which are intended to prevent avoidable human suffering, whether from the fury of the elements, or from the clumsiness, neglect, or malice of mankind. We spoke before of fire-alarms and burglar-alarms. Messrs. Chubb show electric alarms fitted to safes, strong-rooms, and ordinary doors. Fynn & Carle (No. 314), and B. W. Webb (No. 339A), exhibit self-registering money-tills. Professor Denis Monnier, of Geneva, and M. Léon Somzée, of Brussels, have striven to protect the miner by the warnings conveyed by electric energy. The former, under the name of the methanometer, has contrived an automatic analyser for the detection of fire-damp, composed of two parts, the analyser and the receiver. The former are to be placed in the galleries of mines; the latter, in connexion with them, in a central position, under the eye of the engineer. On the proportion of fire-damp becoming as high as nine per cent., the instruments form an alarm signal; and it is claimed that the effect of ventilation on the point of danger can thus be accurately watched from a place of safety. It would be unfair to hazard any hasty judgment on the merits of an invention (as far as the details are concerned) that is intended to confer such a boon on the miner. But we are desirous to call to the subject the attention of those who can submit an elegant theory to the rude test of practice. M. Somzée proposes to arrive at a like result, taking as his starting-point the rise of temperature in the miner's lamp, due to the presence of fire-damp in the air. There is no lack of the inventive faculty displayed by the proposal of six distinct methods of effecting this important object. At the same time, we cannot but think that it would have been more desirable for the inventor, as himself the best critic of his own inventions, to select that method which he thought the best, and to devote his time and thought to its perfection, rather than to allow his imagination to wander over a six-fold field.

We should note, with reference to this important question of the application of electricity to mining, Mr. Crompton's pattern miners' lanterns (No. 203) and those of the Swan Electric Light Company (No. 226). It struck us that one of these new safety-lamps was too large for the convenience of the miner, and also too easily upset, if placed on the ground. To the latter objection the reply was at once made, that it did not matter with an electric lamp in what position it was held. That, we take it, is the case. But, if so, such a valuable characteristic should be grasped by the designer as one of the first elements of a miner's lamp. As such, we venture to think that all the metal work (unless it be by way of protection to the glass), should be placed at the bottom of the lamp, and that a globe or bulb of glass should form the upper part. The irradiation of the roof of the workings would thus be much better than when the metal work of the lamp is fixed, as in those we observed, at the top. Of course the great difficulty here is the connexion with the source of energy. It has been proposed that a small battery should be so prepared as to be carried

on the back of the miner. So long as he had to carry his lamp in his hand this would, no doubt, answer admirably. But when it comes to the use of the pick, the inconvenience of any wire connexion must become apparent. We should be glad to learn from any of those who have made a special practical study of the subject, how far it would be possible, with due regard to weight and bulk, to combine a Faure accumulator, or other form of storing electric energy, with the lamp. By that means, unless bulk and weight prove unmanageable, a safety-lamp of extreme value might possibly be produced. But among thirty-seven English and thirteen foreign exhibitors of lamps, we only observe two who have taken up the cause of the safety of the miner.

Another branch of the subject, in which the electrician comes forward as a minister of Art, is the engraving of hardened steel by means of voltaic electricity. All those who are interested in the work of the etcher or the engraver should visit the specimens, in the eastern gallery, exhibited by J. Hurly Pring, M.D., Enfield, Taunton (No. 326). Some of the specimens here shown were in the Exhibition of 1851, where, however, they attracted attention only as objects of fine art. As such, the inventor disclaims them; and he now presents them, not for their artistic merit, but as examples of the results of a process of extraordinary power, of the full application of which it would be rash to predict the limits. A steel plate, sword-blade, razor, or other object to be engraved is attached by means of a wire to one extremity of an electro-magnetic arrangement, while another wire coming from the opposite pole serves the purpose of a graving tool. The electric scintillations produced by the combustion of the steel are said to be very beautiful. Certainly the bold, deep, clear lines engraved are very good. And the power that is thus given to the artist to sketch freely on steel,—using the electric point with the freedom of the chalk pencil, and at the same time with the permanent result of the burin, is calculated, we think, to introduce a new and very admirable style of art,—quite as special as is the flowing outline sketched by the pencil of a master on the damp surface of pottery, in what is called Raffaelle ware.

Last among the new and promising applications of electric energy to industrial art, we notice the Automatic Silk Reeling Machine of Mr. E. W. Serrell, of New York (No. 454). As to this, as well as with regard to the preceding exhibits of which we have spoken with most interest, we desire, once for all, to disclaim the functions of the jury. We conceive that the great utility of these exhibitions is twofold. First, the attention of inventors and of those who are in need of inventions is directed to what has been already done. Among the exhibits they have to study for themselves, and all that the public writer can do to aid them is to save time and to prevent oversight by calling attention to the most remarkable or most promising exhibits. Secondly, and of more permanent character, is the outcome of the competition, as arrived at by the voice of competent judges. The cases are very rare in which it is permissible for the scientific press to anticipate this verdict. And certainly we desire it to be understood that our own remarks are to be taken *ad referendum*.

That understood, we cannot but recall the experience we have attained in silk-growing countries as to the extreme delicacy of the operation of unwinding the cocoons. These little balls are, in the factories, placed in pans of hot water, and the process of drawing off the unbroken thread is painfully slow. Mr. Serrell claims to unwind a thread at the rate of a mile in eight minutes; and says that this is the first successful machine of the kind, and that it bears the same relation to the silk manufacture that spinning machinery does to that of cotton. We hope that the claim will be verified. We are sure that there is an ample return for the machinist in that case; provided, that is to say, that the essential reform of feeding the worms on the living trees, under temporary houses, be adopted. Not so much, in our opinion, for the sake of the animals,—at least in the first instance,—as for that of the trees. The constant stripping of the leaves, long so ruthlessly practised, has led to the disease and deformation of the mulberry tree; and we regard the silkworm disease as a mere outcome of the injury done to the plants. Either the young shoots should be treated as annuals, cut with scythe or sickle, and thus stripped of their leaves for the food of the worms, or the latter should be allowed to crop their food on the living tree. We have no doubt that by either of these methods sound and good silk is attainable, and then, hey for winding it at a mile in eight minutes!

## LICHFIELD AND ITS RECORDS.

IT was on the 16th day of June, 1881, that the ancient and loyal city of Lichfield once again gave to the page of its local history an item of news which a large portion of the inhabitants would have gladly left unrecorded. On that day, while the grave councillors were debating in their ancient guildhall upon a proposed improvement in Dam-street, leading from the market-place to the cathedral,—in the very street where Lord Brooke met his unexpected death by the shot of "deaf and dumb Dyott," at the siege of 1643,—and while these worthy gentlemen of the corporation in this the nineteenth century were debating whether they ought to pay more than 12*l.* 10*s.* per yard for the 4½ yards of land necessary for the widening of the street, the mayor of the city informed his brethren that the sheriffs were "in possession," and that an officer was holding their property in custody,—even themselves,—for the trifling sum of 3,507*l.* 13*s.* 2*d.* (which included 90*l.* 11*s.* for costs of execution and sheriffs' poundage!) which they owed to Messrs. Pattinson! Of course, the corporation were compelled to pay the money and release themselves, for the law had for once got them altogether very comfortably in their own house; but the fact nevertheless remains matter for history, and we expect it is the first time that such an extraordinary event occurred in the annals of a city, and let us hope it will be the last.

But Lichfield, somehow or other, has gained for itself notoriety in more ways than one. Who can doubt its local affection after reading the return of the election commissioners of 1880? If there was anything comic in the fact of the bailiffs being "in possession" of the Guildhall in 1881, there was surely something very funny in the recorded events during the election for M.P. in 1880. One of these deserves a place. At a tavern on the Classic Green-hill in the city, "mine host" had suspended across the street a garland of true blue with the legend of "Dyott for Ever" upon it. Now the name of Dyott has been the Lichfield pass-word for centuries; but the opposition candidate had also partisans, and some hundreds odd of these determined to assault and take the garland by storm on the eve of the election. The record says that they marched to the place only to find that some bold Lichfield youths had kept guard throughout the night, "eager and ready for the fray," at the sight of which defending force, of less than twenty, the enemy, numbering at least six times as many, beat a hasty retreat. And so the "garrison" with its "garlands" was left to enjoy its peace, its sumptuous breakfast, and, what is more, a march afterwards in strong force to record its vote at the election-booth. There may be some comic elements in history, but this election episode seems to us unusually so, and times have sadly changed since the Civil War period, for 120 men would never then have been scared at the sight of less than a score.

These recent events in connexion with Lichfield, together with the more worthy one,—the laying of the first stone of the new college to the memory of George Augustus Selwyn, its former bishop, at Cambridge, on the 1st of June last, and some more recent events, give us an opportunity of supplying a few interesting facts relating to the city, and a fitting supplement to the brief history which was published in the *Builder* on the 4th of January, 1879, and which historical notes having been widely quoted, lead us to believe that a few more will not prove unacceptable.

Without in any way repeating the history of the city as broadly told, we will add a few notes which may not be generally known to the citizens. For instance, there is a very curious picture of the manners and customs of the time of the reign of Edward III., described in an early petition in French among the public records. In 1342 two Lichfield merchants sent their servants with two horses loaded with mercery and spicery of the value of 40*l.* to the Stafford market. Highway robbery was far from an uncommon thing, and so, when Cannock Chase was reached, they were set upon by some "knights of the road,"—in this case real knights by title, one being Sir Robert de Rideware, and another Sir John de Oddyngeseles, and taken prisoners to Lappeley Priory. They then proceeded to Blythbury Priory, to which place the Lichfield authorities proceeded,—the day being Sunday,—where a desperate fight took place, ending in four of the malefactors being at once beheaded (they did these executions summarily in those days); but as the Lichfield "army" were returning home with the recovered property, Sir Walter de Rideware and others surprised them on the road, and again took possession of the plunder, leaving the bailiff and his company to seek redress at head-quarters,—Stafford. But the friends of the robbers prevented the petitioners entering the town, which necessitated the petition being forwarded to the Earl of Arundel, to hold an inquiry at the earliest session to be holden at Lichfield. How it ended is not recorded, but it certainly exhibits a curious picture of the good old times,—more than 500 years ago.

In the reign of Henry VIII.,—in 1532,—we find among the state papers a complaint made by the fishmongers, that a quantity of salmon and other fish had been exported from Ireland to Lichfield, but that the sale was not valid through the absence of a lawyer at it! This is a curious note at the present time, now the question of the fish supply is being debated upon.

Queen Elizabeth honoured the City with a visit in 1575. She was very fond of a royal progress; and though the people paid for it, they paid cheerfully, for they certainly had the pleasure of seeing her majesty. Among the items in the City accounts of this year we find:—"*Imprimus* to the Queenes most excellent matie in gold, 40*li.* (40*l.*). "For Kepynge Madde Richard when her matie was here 5*s.*" "To the ringers of St. Mary's Church, 1*l.* 4*s.* 0*d.*" "For payntynge and mendyng the Geylehall, 3*s.* 10*d.*"! (Guildhall). "To Six Men to go with the Queenes treasure to Rydgeley 1*s.*" (Rugeley). "For beare, 12*s.*" "For Victualls, 1*li.* 17*s.* 1*d.*; Salt fyshe, 6*s.*"

But close upon three centuries since, at the beginning of the year 1583, Lichfield was in sore trouble about the chancellorship of the diocese. The ending of the dispute was one of the last of Archbishop Grindal's decrees. The whole diocese was then out of order. The dean opposed the bishop, the bishop opposed everybody that was opposed to the man he wanted for chancellor, and the consequence was, there were two chancellors in office at the same time,—Dr. John Beacon and Zachariah Babington; a state of affairs which was only settled by the archbishop exactly nine days before he died. In more modern times the late Chancellor Law was a good friend to the city, and let us hope the citizens will not forget to remember his benefactions by keeping his tomb in St. Michael's Churchyard in repair, and what is of great utility to the travellers by the rail, keep the clock above his tomb in good order too. That the chancellor was a favourite one fact will prove. It is the original parchment vote of thanks bearing the city seal, and now preserved in the Lichfield Museum, together with the original model of the statue of Dr. Johnson. Here is a copy:—

"At a common hall and meeting of the Council of the City of Lichfield, held in the Guildhall, on Tuesday, the 14th day of August, in the year 1838, pursuant to appointment and notice, the Mayor presiding, it is unanimously agreed that the most grateful thanks of the Council are due to the Rev. James Thomas Law, Chancellor of the diocese, for his munificent donation to the City of a statue of Samuel Johnson, which is a faithful characteristic and deeply interesting representation of their illustrious fellow citizen, redounding to the honour of the inhabitants as a just tribute to his immortal memory, and highly ornamental to the city as a work of eminent genius and skill.

JOHN SULTZER, Mayor.
CHARLES SIMPSON, Town Clerk."

In September, 1878, a plaster cast of the sculpture on this monument to Dr. Johnson, which is in the Market-place, was taken for a reproduction of it then proposed for erection at Uttoxeter, in the Market-place there, where Johnson once disobeyed his father, and where, in later years, he performed his extraordinary penance, and which is commemorated on one side of the statue pedestal.

Speaking of the Doctor, reminds us that we have a copy of an abstract of the names of the inhabitants of Lichfield, taken in the early part of Queen Anne's reign. Under the head of Sadler-row, at Market-street, where resided some twenty-four families, we find "Michaell Johnson

Batchelor, 36 yeares; Andrew Johnson, widower, 32; Symon Martin, apprentice, 16; Ann Deakin, servant, 27." This Michael Johnson was the father of our doctor, and as he is described as a bachelor, this list must be of a date before the 19th of June, 1706, when Michael was married to Sarah Ford, at Packwood, in Warwickshire. The reminiscences of a past age crowded upon us when, through the kindness of Mr. Clarke, the tenant of Johnson's house in the Market-place, we took temporary possession of the little room (but little altered) at the back of the shop to which the city bookseller must have introduced his bride, and in which subsequently his illustrious son, so famous for taking his walk down Fleet-street, must have spent many of his infantile hours. It was also with more than ordinary pleasure we received the kind and courteous help of the many friends in the city who, throwing open to us a free inspection of the interesting records in their custody, enables us to complete the valuable account which we now give to our readers.

First, then, we find by the registers of St. Mary's the baptism of the two sons of Michael Johnson, the Lichfield bookseller, whose house immediately faced the church. In September, 1709,—"Bapt. Sam., son of Mich. Johnson, gent, 7." 1712, October, "Bapt. Nathaniel, son of Mr. Michl. Johnson, 14." They are simple entries truly, but they have been viewed by countless numbers, who, from all corners of the world, have made many pilgrimages to Lichfield to see all that is to be seen relating to the author of the celebrated Dictionary and the world-renowned poet. The following entries from the St. Michael's registers give us official proofs,—if any were wanting,—of the burials of the father, mother, and younger brother:—1731, Dec. "13. Buried Mr. Michael Jonson, a magestrate of y' city." 1736-7, March "13. Buried, Nathaniel Johnson." 1759, January. "23. Bur$^{d}$. Mrs. Johnson, widow, aged 89." The three were buried in a tomb in the church, and over it was placed a stone, with an inscription, composed by the doctor. We should very much like to know what has become of this stone, and we know the present rector will. He has made every search for it. It was there in 1796, when, says Harwood, it was removed during the alterations. Alterations and restorations often destroy what money and time can never replace, and here is a glaring instance of the bad results sometimes of so-called "improvements." We next come to a very interesting matter. In the Salt Library at Stafford are preserved the original papers relating to the sale of the Johnson House, at Lichfield, in 1785. A brief abstract (taken by us, thanks to the kindness of the librarian) will, we are sure, interest. The house, it appears, sold for 235*l*.; a year's rent of it realised 12*l*., and other receipts 5*l*. 5*s*. make up a total of 252*l*. 5*s*. Miscellaneous expenses (including 4*l*. 4*s*. to Mr. Cresswell, the auctioneer, 2*s*. 6*d*. a year's rent due to the Corporation for it; and 13*s*. land-tax) 36*l*. 15*s*., leaving 215*l*. 10*s*. to be divided. Accordingly, 53*l*. 17*s*. 6*d*. were paid each to Thomas Johnson, Benjamin Johnson, William Whiting (and Ann his wife), and Mary Bill, which was in accordance to Dr. Johnson's will, and all of which signed for the same, 17th July, 1786. One important fact occurs in these papers. It has been hitherto stated the Corporation received 5*s*. a year rent; we now find it was the still more nominal amount of half a crown,—truly exhibiting the good feeling of the city towards the doctor, and respect for the memory of his father. Before bringing our Johnson notes to an end, it may be interesting to remind our readers that in Boswell's Life of the doctor occurs the passage that he (Dr. Johnson) wrote "Rasselas, Prince of Abyssinia," in the evenings of one week, sent it to press and published it, "that with the profits he might defray the expense of his mother's funeral, and pay some little debts which she had left." Strahan, Dodsley, & Johnston gave him 100*l*. for it, and 25*l*. more when it reached a second edition. This fact may be new to many who have read the well-known tale, and will give a good idea of how literature is sometimes produced under extraordinary pressure.

Next door to the Johnson house is a modern building which recalls a melancholy event. A terrible fire occurred in the house on its site in January, 1873, in which perished the whole family of seven persons, of the name of Corfield. They were buried in one grave, in St. Michael's Churchyard, and the tragic fate of the family was complete when, on November 1st, 1877, James Corfield, the *last* of the family, met his death by a fall off the engine he was driving at Stafford.

At the Three Crowns, the inn where Dr. Johnson stayed when he visited the city, and which is next door but one to his birth-place, was established in 1787 the first of the Masonic lodges in Lichfield, and in 1794 the Female Friendly Society met here, a copy of whose rules is preserved in the city Museum.

Thanks to the present worthy Dean of Lichfield, the cathedral restoration is progressing quietly, and, we believe, surely; but we venture to think there are but few such public-spirited custodians of our cathedrals, seeing that in his zeal for the welfare of his beautiful church he made himself responsible for a large portion of the 30,000*l*. which the public had been asked to subscribe. Some thirty of the new statues for the west front have been placed in position, or about half the number designed to supply the place of those so wantonly destroyed in bygone times. In fact, before the Civil War there were ninety-nine "fayre statues curiously graven and carved in free stone, of kings, patriarchs, prophets, fathers, and apostles," and of these those that escaped the soldiers at the time of the siege of Lichfield were removed from time to time since.

Speaking of the siege reminds us of the disastrous effect it had upon this beautiful church. A reference to the guide-books will tell a sorrowful tale, but we think the following extracts from the journals of Parliament will not be without their interest. On the 14th March, 1642-3, two letters from Lichfield were read to the house, detailing the taking of the Close, and about 200 prisoners, and requesting a supply of money and horses, which being read and agreed to, the house "ordered, that Sir Edward Littleton and Mr. Noble do write unto the gentlemen at Lichfield, and return them thanks from this house for the great service they have done." It must be noted that Sir Edward Littleton was M.P. for Stafford county, 1640-6, and Michael Noble, M.P. for Lichfield, 1640-50. Of the latter gentleman's wife some curious notes are given in the *Builder* of January 4, 1879. In 1646, the House of Commons, on July 9, desired Sir William Brereton to go down to Lichfield and assist in the siege operations; the next day, 5,000*l*. were voted; and on the 17th, 100*l*. ordered to be paid Capt. Pudsey for bringing news of the surrender. Then came the crash; what the ruthless soldiers had not done, Parliament in time effected. On the 4th April, 1651, it was "Resolved that the Cathedral of Lichfield be disposed of for the use of the poor to set them on work!" It is true the building had by this time been sadly stripped of its valuables, and it is equally true that the Parliament quietly voted the sale of the residue, and of the money to be raised thereby one moiety was to be given to the poor of Lichfield, and the other to the poor of the diocese. Yet by its remonstrance in February, 1654, Stafford had not then received its 600*l*. of the proceeds. Of the condition of the cathedral, even six years later, we have good evidence, for early in 1660 the Michael Noble already mentioned, desired by his will to be buried "in the *late* Cathedral Church," while a note in one of the Ashmolean MSS., dated June 16th the same year, says:—"This morning, Mr. Rawlins, of Lichfield, told me that the clerk vicars of the cathedral had entered the chapter-house and there said service, and this, with the vestry, was the only place in the church that had a roof to shelter them!" A year later, however, and the city had a new bishop. To John Hacket, Lichfield is indebted in more ways than one, and of the 20,000*l*. spent in the restoration of the cathedral, he himself gave 1,700*l*. And no one rejoiced more than he did when, on Christmas Eve, 1669, the restored building was dedicated.

Talking of bishops, reminds us that even Lichfield has had some peculiar representatives. A former dean of the diocese,—Thomas Wood,—succeeded John Hacket in the see, and held it from 1671 to 1692, but instead of taking an interest in the city, his interest appears to have been far away from it, for he actually resided at Clapton, in the parish of Hackney, Middlesex, where he founded almshouses, and left tokens of his charity there, at Oxford, and at Ufford, in Suffolk, where he was buried; but to Lichfield nothing, except the incomplete palace in the Close, which, in 1687, he commenced building, it is supposed, to appease the anger of the Archbishop, who had cited him to repair to his diocese, but which he had refused to obey. His palace has only in recent years been tenanted by the Bishop, for all the early ones preferred Eccleshall Castle, which, it will be remembered, was sold a few years since.

The two last bishops of Lichfield, Lonsdale, and Selwyn, were each well deserving the appointment, and have left behind them names that will not easily be forgotten. John Lonsdale, the eighty-ninth tenant of the see, supported and carried to a successful foundation, the Theological College which the Rev. E. J. Edwards and E. T. Codd started, as a project, in 1852; and on March 6, 1863, he presided at a general chapter of the cathedral, which had not been held previously for just one hundred years.

Before closing these notes on the cathedral we cannot refrain from mentioning a very interesting MS. preserved in the Salt Library at Stafford. Mr. Mazzinghi, the obliging librarian, kindly favoured us with a look at it, and although too long to be given in full, we think an abstract will prove of more than ordinary interest. It is entitled, "Mr. Walmesley's account of the bells in the cathedral church of Lichfield, and of the Society of Ringers, called by the names of the Loyal Youths in the City of Lichfield, December 20, 1686." The orders are sixteen in number. The first Master was Richard Dyott, esq., and the Warden, Michael Lambe. Each member upon admission to pay twelve pence; to attend in the cathedral belfry every Thursday at five o'clock in the afternoon for practice, and if absent without cause to forfeit 6*d*. The Warden for the time being to keep the bells and ropes in proper order, provide oil and candles, tar the bells, towards the expenses of which each member shall pay twelve pence quarterly, and ten shillings among themselves yearly to Thomas Morgill; any member offending by swearing or otherwise misconducting himself to pay three pence. The fourteenth rule reads:—"Item, That the said Master shall upon the fifth of November yearly, if not Sunday, and when it falls out upon Sunday, the day following, provide the company a posse of roast beefe to bee eaten at the house of the Warden, together with a bottle of ale to each member of the said society to drinke the king's health."

The plan of the cathedral in 1881, which was printed last Easter, and owes its publication, we believe, to the present Dean, assisted by the indefatigable clerk of the works, Mr. J. T. Irvine, is one of the most interesting broadsides we have ever seen. It is a perfect store-house of facts at a glance. It shows the ancient and modern parts of the cathedral, the position of all the monuments, the dates of erections, restorations, and everything interesting. From the year 1200, which the choir is supposed to date, to 1879, everything of interest is noted. But one curious fact we are told. The cathedral interior is not in a straight line, "there are no less than six strongly-marked deflections between the extreme west and extreme east of the building, corresponding for the most part to the different periods in which it gradually reached its present dimensions." The total length of the cathedral is 403 ft.; nave, 175 ft.; width of nave (with aisles), 65 ft. 8 in.; length of transept, north to south, 149 ft.; height of central spire, 252 ft.; height of south-western spire, 192 ft.

The south transept dates from 1220; north transept and chapter-house, 1240; nave, 1275; west front, 1275–1350; lady chapel and presbytery, 1300 to 1330; and the stained glass in the chapel windows came from the Abbey of Herckenrode, near Liège, in 1802.

The mother church of Lichfield is dedicated to St. Mary, and was rebuilt upon the ancient foundation 1855–70. It is the fifth that has been erected on the site, and has a lofty tower and spire. In fact, Lichfield is called the City of Spires. The monuments in the church are interesting, especially those of the Dyott family. The registers, too, are in good preservation, and to the kindness of the vicar, the Rev. M. H. Scott, we are indebted for a lengthy search through them. On the cover of the earliest one is given the weight of the eight bells in 1726,—80 cwt. 3 qr. 23 lb., the tenor weighing 19 cwt. 1 qr. 18 lb. There are also the names of thirty-nine persons who were touched for the king's evil "in y$^{e}$ midle quire of the Minster Church," 1685–7, and the names of fifteen children "born to dissenters" between December 27, 1696, and February 26, 1728–9! The Ashmole family was associated with the parish from the earlies times down to within a few years ago. Th

registers commence October 5, 1566, and the first of the family is the marriage of Nicholas Ashmole with Margery Byrkett, January 23, 1571. The entry of June 2, 1617, "Elias, sonne of Symon Ashmole, was baptised," records the baptism of the founder of the Ashmolean Museum at Oxford. On February 19, 1636–7, the "Sir Symon Weston, knight, buried," was the Recorder of Lichfield under the charter of James I., and succeeded three dukes of Somerset in that office. Among the curious entries are the following:—On February 9, 1684–5, "King James II. proclaimed King of England y^e 9^th^ at Lichfield, at four o'clock in the afternoon, with much rejoicing." On April 26, 1583, "two strangers of St. Michael's" were buried. On December 14, 1725, "Bapt. Richard, borne in the street of a stranger." On June 1, 1743, "Bapt. Richard, son of Thomas Slaughter, being y^e^ first y^e^ silver basin was made use of." February 8, 1776, "Bapt. Elizabeth, daughter of Mr. Joseph Penn (Player)." May 31, 1778, "Bapt. John, son of Margaret Macgill, a travelling woman." On the cover of the second register is written "Mr. Thomas Adey, magistrate, claims the place where Mr. Onion's last wife was buried."

St. Michael's Church is situate on Greenhill, and is also of an ancient foundation. It was restored in the year 1842, when the vault of the Earls of Donegal was bricked up. Here is preserved in a niche in the church the very interesting sculptured stone representing a citizen of Lichfield in the fourteenth century, which was discovered when pulling down a wall in 1846. The churchyard, which is the chief burying-place of the city, is the largest, perhaps, known, being 7 acres in extent. It is also of a peculiar marshy nature, although standing at a great height. Here, close to the high-road leading to the Trent Valley Station, is the celebrated clock tomb of Chancellor Law; here also, close to the church, is a remarkable grave-stone,—so remarkable, indeed, that it has puzzled many an antiquary. The original inscriptions, partly defaced, are on one side; the renewed ones on the other. The latter read thus:—

| Here lyes the body of William Clarke who was Clerk of this Church 51 years and buried March 25 1525 and aged 96. | Here lyes the body of William Clarke Clarke of this Church 71 yeares who died Sept. 26 1563 and aged 96. |
|---|---|

Restored 1870.

These lengthy services upon the face of these inscriptions are enough to take one's breath away, but unfortunately "Here lyes" is to some extent correct. Of the clerk who died 1525 we have no evidence, as the date is at least a dozen years before parish registers began to be kept; but of the inscription number two we have a very decisive proof of its telling us the "lie" direct. Thanks to the great kindness of Mr. Sergeantson, who devoted much valuable time in gratifying our curiosity, we found the burial register to read thus:—"William Clarke, the clarke of St. Michael's Church, lij yeares, was buryed the xxv^th^ day of March, Anno Dñi, 1595." Here, then, the register proves that he was clerk fifty-two years, and not seventy-one years, as on the stone; and that he died at least thirty-three years later than the stone gave him credit for! Now we would suggest that in trying to read the nearly-obliterated inscriptions, the dates and persons have been misplaced, for the first reads "Clerk of this church fifty-one years, and buried . . . . March . . . ."; and the other "Clarke of this church 7 . . . . yeares, who died . . . ." We had no time to search the register through, but a careful perusal might end in the first one being he who died in 1595, and the second one the clerk who died at a later date.

But our wonderment was not abated when the very next stone in the churchyard records,—"Here lyes y^e^ body of William Clarke, gent. Borne in Lichf. Lived in London. Clarke in y^e^ Excise Office, . . . ." Unfortunately the date is buried, but he must have been the William Clarke to whom his son William addressed the letters in 1678, which are now preserved in the Ashmolean Library, Oxford. The Clarke family must have been a noted long-life one in Staffordshire, for in the churchyard of Stoke-upon-Trent is a stone recording "Sibil Clarke, 1684, aged 112. Henry Clarke, aged 112." But the "hereditary" office of parish clerk has never been so clearly demonstrated as is shown by the records of Didsbury, Lancashire, where the family of Wood held the office from 1591 to 1839,—a period of two centuries and a half!

We will now just take at random a few entries from the St. Michael's books likely to interest our readers, and not hitherto printed:—

1632. "Thomas Smalridge buried with a coffin, the 9th of October."

1634. "A strange man that perished in the snow." January 31.

1704. August 12. "Buried a child of John Bills, unbaptized."

1727-8. February 14. "Buried Rebecca wife of William Pinkerman, an acktor."

1749. May 29. "Buried a stranger and old soldier."

1777. February 21. "Buried a spurrious and adultrine child of William and T. Alsop and Jones."

1779. March 16. "Buried a child belonging to the militia."

1780. November. "Sepult. Ann, Countess of Donegall, from Fisherwick Park. 22d."

1809. March. "Sepult. Joseph, son of William and Ann Harper, who was killed by a cow in the churchyard. 31."

In 1628 was buried Francis Wood, who in his will left this very commendable direction:—"Item. My will and mind is that my exors. shal be good unto my tennants, and not to putt them out of those things w^ch^ they hould soe long as they paye their rent, and do as honest tennants should doe." In 1635, on March 18, 20, and 21, are four consecutive entries,—two baptisms and two burials of the name of Smith, three of the entries relating to three different families of that name! On August 30, 1704, occurs this very significant entry:—"Married at Homberwich Chapell, Richard Taylor and Mary Taylor, both of the parish of St. Botolph, Bishopsgate, London." Was it a runaway match? In 1728 was buried Alice Hayes, who (according to the tombstone) "fled from Popery and famine at the famous siege of Londonderry, A.D. 1689." In 1810 were buried (in one grave), as the tombstone informs us, "N. W. J., Lichfield, June 1, 1810,"—John Neve, aged 25, William Weightman, aged 26, and James Jackson, aged 48, who were the last persons executed in Lichfield for forgery. In 1870, George Mather, "for more than fifty years clerk, sexton, and ringer," aged 85. A Minton tile, with some curious emblems of his office, has been erected by the rector in the old vestry. And last, but not least, in September, 1879, was buried here Henry Littler, the head verger of the cathedral, whose unfortunate death caused a greater sensation in the city than we ever expected the quiet, immovable place to be guilty of. But, then, poor Littler was universally respected, and that is something, and a great virtue, too, in any city. Not far from his grave is that stately avenue of elm-trees so well known to visitors. The parish records tell us they were planted on the 26th of February, 1750, which, being "a windy Tuesday," gave rise to the saying hereabouts that the wind is always stronger at this place than any other in Lichfield.

We next paid a visit to another church, the ancient Stowe, dedicated to the first bishop, St. Chad (A.D. 669–672), who had his hermitage, it is supposed, upon the site, and subsequently founded the earliest Lichfield church. In a recent address by the present dean, upon "The Mercian Church and St. Chad," he reminds us that "a wide span of ages separates us from him; but a bright arch of eternal truth unites the Missionary Chad and the Missionary Selwyn." The old Stowe Church, a venerable structure, with a tower which looks as if it has not many years longer to live, has been a picturesque object from the cathedral close for ages. The vicar, the Rev. John Graham, kindly permitted us to "look around," and a look into the registers in which occur many interesting entries relating to the families of Biddulph, Dyott, Ashmole, and King. Of the latter family was Gregory King, the well-known Lancaster Herald, who was born in this parish in 1648, and was buried at St. Benet's, Paul's Wharf, London, 1712. The St. Chad's registers are missing for the dates between the 23rd of May, 1638, and the 28th of August, 1650, so we are unable to record his baptism; but the burial of the mother (and his father's first wife) is thus entered:—1668, April. "Elizabeth, wife of Gregory King, buried. 22." One of the valued manuscripts in our collection contains trickings of the arms in Lichfield Cathedral in 1663, which Young Gregory, then clerk to Sir William Dugdale, the well-known antiquary, executed for his employer. Among the curious entries in the St. Chad's register is one dated 1676, the baptism, on the 7th of December, of Grace, Mercy, and Peace, the daughters of Michael Allen; but the two latter being buried the next day, Grace alone survived of the three. In the churchyard is a stone to George Houldsworth, 1812. "He was; but words are wanting to say what. Think what a husband should be: he was that."

Christ Church is a modern building, having been erected in 1845–7 by Mrs. Hinckley, the daughter of Dean Woodhouse. St. John's Church is attached to the hospital of that name erected 1495, and was restored in 1870–1 through the influence, we are told, of the Rev. P. H. Dod, the master; although the guide-book to the city, by the well-known local antiquary, John Hewitt (who was buried in the Cathedral Close, January, 1878), informs us it was to Chancellor Law, who was many years master, that "it owes its new life."

Within a few paces, behind the buildings in St. John-street, and extending to a line with the city conduit tower, is the friary and its grounds. Here was founded a convent of the order of Grey Friars, who came into England as early as the beginning of the thirteenth century, when they opened an establishment at Lichfield. The Grey Friars were, at first, called Franciscans, St. Francis having been their founder; then Grey Friars, from the habit or long grey cloak which they wore, the hood being made suitable either to cover the head or hold such provisions as were given them by the benevolent; a cord round their loins completed their dress. The friars depended upon the charity of the outside world, and begged their way on foot from door to door, whereas the monks kept themselves close inside their monasteries and lived in common upon their own property. To this order several popes were very good by granting various immunities, among which the privilege of being buried in the Franciscan habit which would secure them from "the Evil One." The old friary was destroyed in the fire which burnt the city in 1291, was rebuilt, and finally dissolved by Henry VIII., in whose reign the present building was erected. From that monarch, the property passed through many private hands, one of whom, John Hill, in 1638, had a plan drawn of it (printed in Harwood's History of the city), and from here in 1640 addressed a letter to Elias Ashmole. Richard Johnson, a century and a half ago, devised it by will to the parish of Nether Seal, co. Leicester, and to the trustees of the manors of Chilcote and Stretton, co. Derby, for charitable purposes. In 1746 was discovered the old monumental slab now preserved in the east wall of the building. It records the memory of Richard the merchant, who, probably believing in the pope's privileges, joined the religious order as a safer way of getting to heaven! In 1779, two very interesting drawings were made of the friary buildings as then existing. One is taken from the west, the other south-west. They exhibit at a glance the whole range extending to St. John's, while the tower of St. Mary's and the cathedral spires are seen in the distance. These two drawings are, we understand, the oldest views of the friary known to exist, and are preserved in the collection of Mr. T. C. Noble, of London, who some time since exhibited them to the principal citizens of Lichfield.

Next to the friary gates was erected, in 1863, the conduit clock tower. The tablet on it says: "H. de Campanel founded the Crucifix Fountain, 1301, A.D.," for the use and solace of the friars. Afterwards four conduits supplied the city with water, and about the year 1823 pipes were laid into the houses, and now we have reason to think it is one of the very few cities indeed which can boast of a water fountain outside and inside most of the tavern doors.

The celebrated Greenhill Bower is held every Whit-Monday. It is after the style of the Lord Mayor's Show in London. A procession of citizens, knights in armour, city heralds, bands, volunteer corps, &c., the festivities winding up with a cold collation in the Bower to all comers, and dancing in the Guildhall or Museum grounds. It is "the day of days" in Lichfield, and originated from the ancient custom of the View of Arms, to inspect the citizens' means of defence.

The city museum is placed above the free News-room and Library, opened April 26th, 1859. The building stands in enclosed grounds reclaimed from the osier-bed of Sandford Pool, and facing the high-road. The antiquities preserved here are many and curious, including a fine collection of medals, tokens, and coins; also a large earthenware vase, inscribed "Lichfield

Conduit Workes, June 16, 1711. In Nottingham made." There are some interesting portraits of celebrated citizens, and many varieties from Green's and Wright's old Museums in this city, so world-renowned a century ago. Next to this building is one specially appropriated as the district Court of Probate, which contains local wills and administrations from thesyear 1516. There are associated with this establishment those three graces which we should like to see in many other district Probate Courts,—civility in the officials, completeness in the arrangement of the documents, and cleanliness in the depository for their safe-keeping. Only those whose business compels them to make use of a district court for searching purposes can tell that these three virtues are absolutely necessary, and we hope the time is not far distant when the Lichfield court will produce good imitations. While here curiosity prompted us to "read" the oldest of the Shakspeare wills preserved here,—that of Christopher Shakspeare, of Packwood, co. Warwick, 1557. Now, we have heard a good deal about the way of spelling the name of the poet; but here, in this little will and inventory of a man whose goods and chattels were only valued at 49*l.* 6*s.* 8*d.*, we find his name spelt three different ways,—"Shakespeare," "Shaxpeare," and "Shakspeer." In the short will of a groom of H.M. Chamber, proved in London, 1608, we find a like deviation,—"Morrey," "Morraye," "Murraye,"—which clearly shows that pedigree-hunters should not be too fastidious how names were spelt in the good old times, and we could instance scores of such eccentric, or, rather, the careless, habit in which scribes indulged.

But one word more, and that will be interesting. What has been the progress of Lichfield as regards the census? That is a momentous subject at all times to a city, and yet it has not grown as other cities have. Exactly 100 years ago the city was carefully surveyed, and in 1781 there were in it 765 houses and 3,771 persons, and of these numbers 43 houses and 216 persons were belonging to the Close. In 1880, the population was 4,512. In 1881, the return just issued tells us that in the municipal and Parliamentary (or actual city) district, the houses are 1,681 and the population 8,360, being only 128 houses and 1,013 persons more than were there ten years ago! Surely not an excessive rate to travel at for a cathedral city. But let us complete the table. The superintendent registrar's district shows that in an area of 72,745 statute acres there were 6,591 inhabited houses in 1871, and 7,579 in 1881, while the population had increased from 32,165 to 39,261. But then these figures represent the surrounding parishes, and not Lichfield city proper. And the cause of the city not increasing in the same ratio with other cities would seem to be that it is neither a manufacturing nor, speaking commercially, a commercial town. When Boswell and Dr. Johnson visited it in 1776, the latter tells us "very little business appeared to be going forward. I found, however, two strange manufactures for so inland a place,—sailcloths and streamers for ships." And when Bozzy accused Johnson (who was a native, please bear in mind), "You are an idle set of people," our Sam replied, "We are a city of philosophers; we work with our heads, and make the boobies of Birmingham work for us with their hands!"

We heartily, however, congratulate the citizens upon some improvements, and we trust they will not be backward in carrying out others; some are yet urgently required. We are pleased to find that the gas-lighting is of a less eccentric character than formerly. Fifty years ago, it is true, the 250 to 300 *oil*-lamps were extinguished by two o'clock a.m. between September and April; in modern times the gas-lamps were extinguished at twelve, and when the moon was supposed to shine they were not lighted at all. We recollect, however, the "betwixt and between." One night the lamps were lighted before dark, and the moon subsequently shone most brilliantly; the next night was a very dark one, and the lamps remained unlighted, and the inconvenience we experienced in our journey through the city we can amply testify. But within the past two years the lamps have been lighted every night, but extinguished at half-past eleven p.m. Then, again, there is another improvement. The post-service enables a correspondent to send off a letter to London at nine in the morning and receive a reply to it in the evening of the same day. It is never too late to mend, and one of these days we may hope to see some encouragement given towards providing temperate amusements for those who fail to find amusements at home, and who wander through the highways and byways of the city, and stroll into its privileged places so freely licensed, because there is no other public establishment open to receive them.

## ANCIENT BUILDINGS AT AMMÂN, MOAB.

ATTENTION has already been drawn by letters from Mr. Besant, secretary to the Palestine Exploration Fund, to important discoveries made by Captain Conder, R.E., of rude stone monuments in Moab, round Mounts Nebo and Pisgah. I now forward particulars of a very singular building on the citadel hill at Ammân (Rabbath-Ammân), at no great distance from the palace at Mashita, discovered by Canon Tristram, to whose work a very interesting architectural chapter as to the palace was added by Mr. Fergusson. The building at Ammân has also been visited by Canon Tristram and Colonel Warren, the latter of whom was enabled to take a good photograph of it, and to get a general plan of the remains of the city, which plan was published in the Quarterly Statement of the Fund, 1872, p. 66, accompanied by a short description by the Rev. A. E. Northey. Canon Tristram has also described the building in the "Land of Israel," p. 588, thus:—"The interior architecture of the church, if not in the purest taste, is marvellously elaborate. It is faced with 120 small round-topped niches, each shallow, and the panels filled with carving of endless variety. No two are alike, either in the sculpture of the arch-heads or of the panels. Flowers, leaves, and fruits are the predominant designs, forming quite a pattern-book for Gothic decoration. The upper story is filled with niches of similar plan, but much larger, extending to the roof. Eight panels of leaves and pines, all in different patterns, occupy the faces towards the centre, and many others the limbs of the cross. The whole reminded us somewhat of the ancient church at Athens, though that is much poorer and on a smaller scale. The state of preservation of this building is truly marvellous."

But these curious architectural details were not, unfortunately, drawn by him. Captain Conder has now supplied these, together with a photograph taken by the second officer in charge, Lieut. Mantell. The plan externally of the building is, roughly speaking, quadrangular 85 ft. by 80 ft. But internally it is that of a Greek cross, the centre part being occupied by an open court, 33 ft. square, in each side of which is a recess, 18 ft. wide and 18 ft. deep, arched over, but open to the court in front. The arches appear to be pointed. Three of the spaces completing the square are occupied by vaulted chambers, and in the fourth (north-west angle) are the remains of a staircase.

The large recesses are 33 ft. high to the apex. There are no remains of dome or other roof over the crux. The building has been variously described as having been a church or a mosque. The plan bears some resemblance to that of a Greek church, but differs from it in some essential particulars, and more resembles that of such buildings as the mosque at Broussa, whose date is known to be of the fourteenth century, or of Hassan at Cairo of the same date, or the new mosque at Algiers, built in the sixteenth century, both of which were designed by Christian architects for Mahommedan worship. There are special features in the building at Ammân which render it very interesting. In the first place, the great arches over the recesses and the wall spaces on each side are designed in almost exactly the same way as those of the Tak Kesra at Ctesiphon, as shown in Mr. Fergusson's History, and to a large scale in Flandrin and Coste's "Persia." This is assigned by him to the Sassanian period, A.D. 550, and the Ammân building, though very much smaller, is so like to it that no one, whether architect or not, can fail to be struck by the resemblance.

But the details at Ammân much exceed those of Ctesiphon in richness. To quote Captain Conder's words,—"The main feature is the elaborately-sculptured ornamentations of the inner walls, the style of which, as a whole, is quite unlike any sculpture found in Western Palestine."

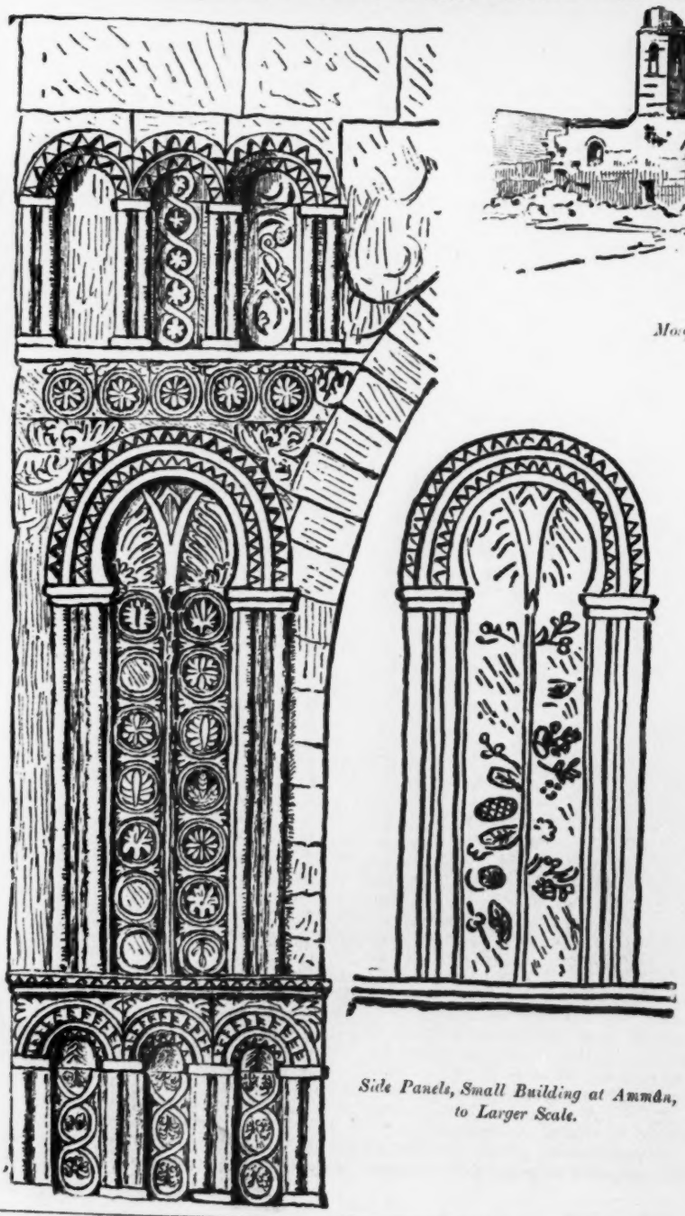
The ornament to which he refers consists mainly of panelling, as at Ctesiphon. But instead of being plain, as there, the semicircular arches are much enriched, and the larger ones enclose others of distinctly a horseshoe form,—the panel having a centre mullion. The narrow lights thus formed are filled in with roundlets, each having a rose or other ornament in the centre. Captain Conder notices that "there is an entire absence of any figures of animals." As to "the vine-branches which occur in the interior of some of the panels," "several conventional vine patterns occur not only on the later Jewish tombs, when Greek art influenced the native sculptors, but also in Byzantine tombs and chapels of the fifth and sixth centuries in Western Palestine," and "among the details are a flat tooth moulding, which somewhat resembles the ornament applied by the Crusaders to arches in their early churches of the twelfth century, as in the beautiful west end of the Muristan, Jerusalem." The architectural peculiarities to be noted from the foregoing statements are,—the general design, the horse-shoe, and (probably) pointed arches, the ornamental filling-in to the narrow lights, and the tooth ornament. The design appears clearly to have been derived from Sassanian sources.

The origin of the horse-shoe arch is not so clear, but we have several well-dated examples of it in the sixth and seventh centuries, as at Dana, on the Euphrates, and at Edessa, as described in Pullan's "Byzantine Architecture." Another well-dated example has been kindly pointed out to me by Mr. Fergusson, viz., a Syrian MS. finished in 586, a copy of which is given in the splendid work of Garucci, and which shows horse-shoe arches within semicircular ones.

The filling-in to the panels at Ammân is very similar to that of the windows in many of the small Greek churches, *e.g.*, the Cathedral at Athens, the date of which is supposed by Couchaud ("Églises Byzantines") to be the sixth century; whilst Mr. Fergusson considers the date to be of the eleventh, twelfth, or thirteenth century. From careful examination of these and other old Greek churches on the spot many years since, and again quite recently, I am in accordance with Mr. Fergusson, to whom I have given the reasons for my opinion. The part of the Muristan, at Jerusalem, to which Captain Conder refers, which I know well, and of which we have a fine photograph taken by Lieutenant Kitchener, is of the twelfth century. The result as to the Ammân building would appear thus to be that it was designed at a late period, in the traditionary style of the Sassanians, with the horseshoe arches of the East (whatever their origin), the Byzantine fillings-in of the windows and peculiar ornament used by the Western nations in their twelfth-century work,—as singular a medley as is, I believe, to be found anywhere. Near to the above are the ruins of a mosque, the greater part of whose walls and minaret remains, and of which we have photographs taken by Colonel Warren and by Lieutenant Mantell. Captain Conder describes it thus:—"It is a typical mosque, resembling in plan the White Mosque at Ramleh, and measuring 183 ft. by 129 ft., built of finely-dressed stonework. The minaret is nearly perfect, and the staircase intact; two of the entrances have stone lintels under the arches. One arch is 7 ft. 6 in. span, the lintel-stone 9 ft. long. Another has two lintels, each 16 ft. long. The stones appear to have been cut for their present purpose, and to have very little structural use. There are no traces of any inscriptions beyond a rudely-carved Moslem religious formula over the door, which appears to have been cut at a late period by an unskilful hand."

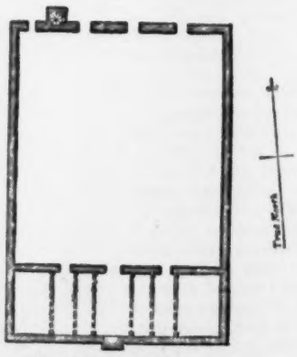
The architectural interest attached to this is that these peculiar lintels were used in the early centuries A.D. in and about the Hauran, as may be seen in Count Vogüé's book on Central Syria, *e.g.* at Bozra. To show still further what architectural interest attaches to these countries east and south of the Dead Sea and east of the Jordan, I may mention that Professor Palmer describes in his report (to the Palestine Exploration committee) of his journey through the rarely-visited country through Petra to Beersheba, the finding grand remains of the ruined city of Sebaita, supposed to be the Zephath of the Old Testament. The ruins are about 500 yards long and 300 yards wide, the streets still to be traced, and there are large remains of three churches, many of the walls being 20 ft. to 25 ft. high. "The houses are built of stone, and the want of timber beams has been most skilfully supplied, all the lower stories being built with arches, about 3 ft. apart and 2 ft. wide, long thick beams

SMALL BUILDING AT AMMÂN: INTERNAL VIEW.—*From a Photograph by* COL. WARREN, R.E.



*Side Panels, Small Building at Ammân, to Larger Scale.*

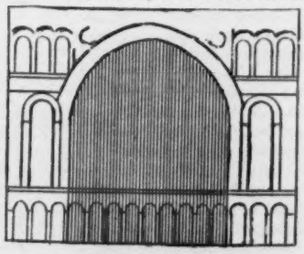
*Mosque at Ammân: Interior View.*

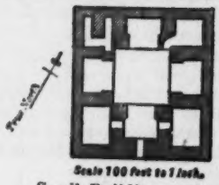


Scale 100 feet to 1 inch.

*Mosque at Ammân.*

*One Side of Court, to Increased Scale.*





Scale 100 feet to 1 inch.

*Small Building at Ammân.*

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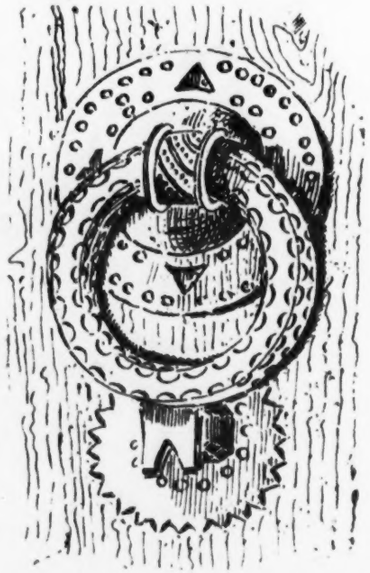
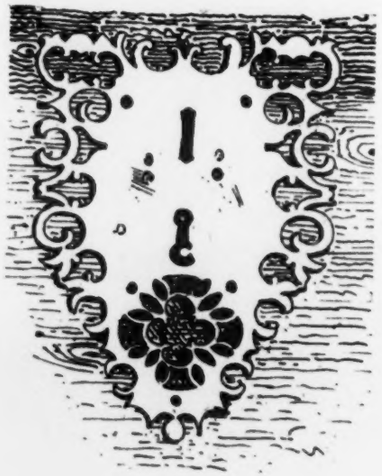
DESIGN FOR BAGSHOT CHURCH.—SUBMITTED BY MR. T. GOODCHILD, ARCHITECT.





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## Specimens of Spanish Iron Work.

Dr. Chris: Dresser: F.L.S. &c.

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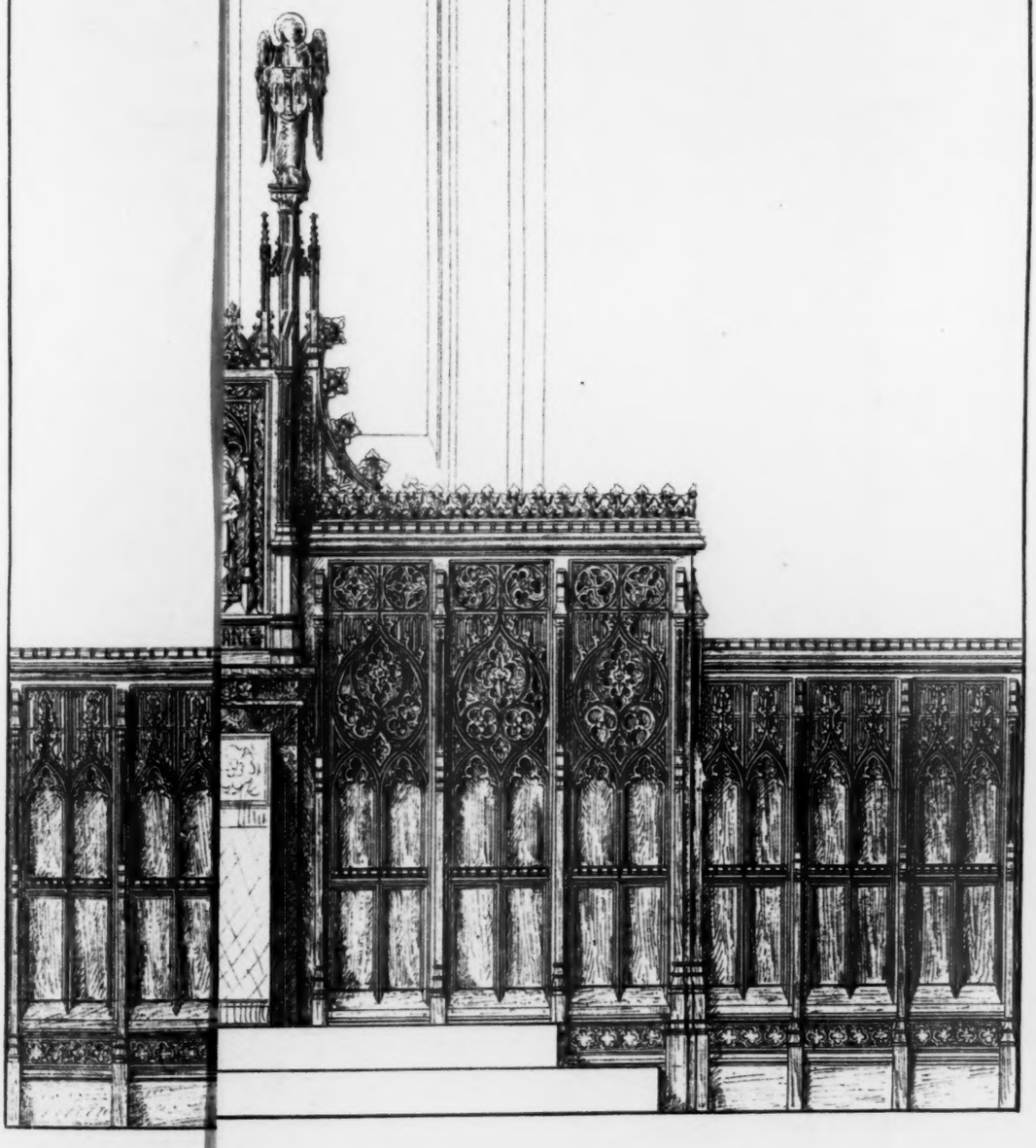

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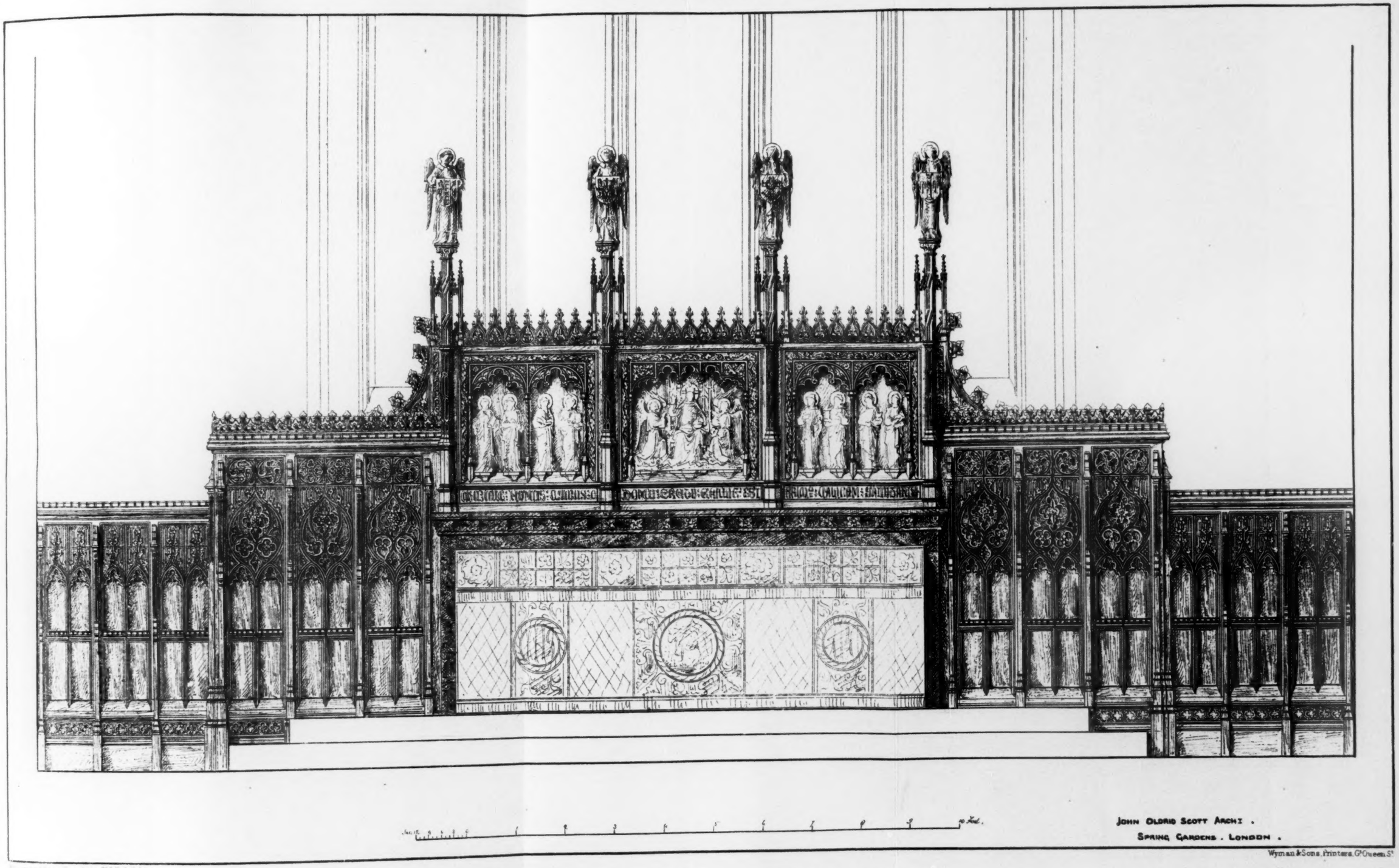

JOHN OLDRID SCOTT ARCHT.
SPRING GARDENS. LONDON.

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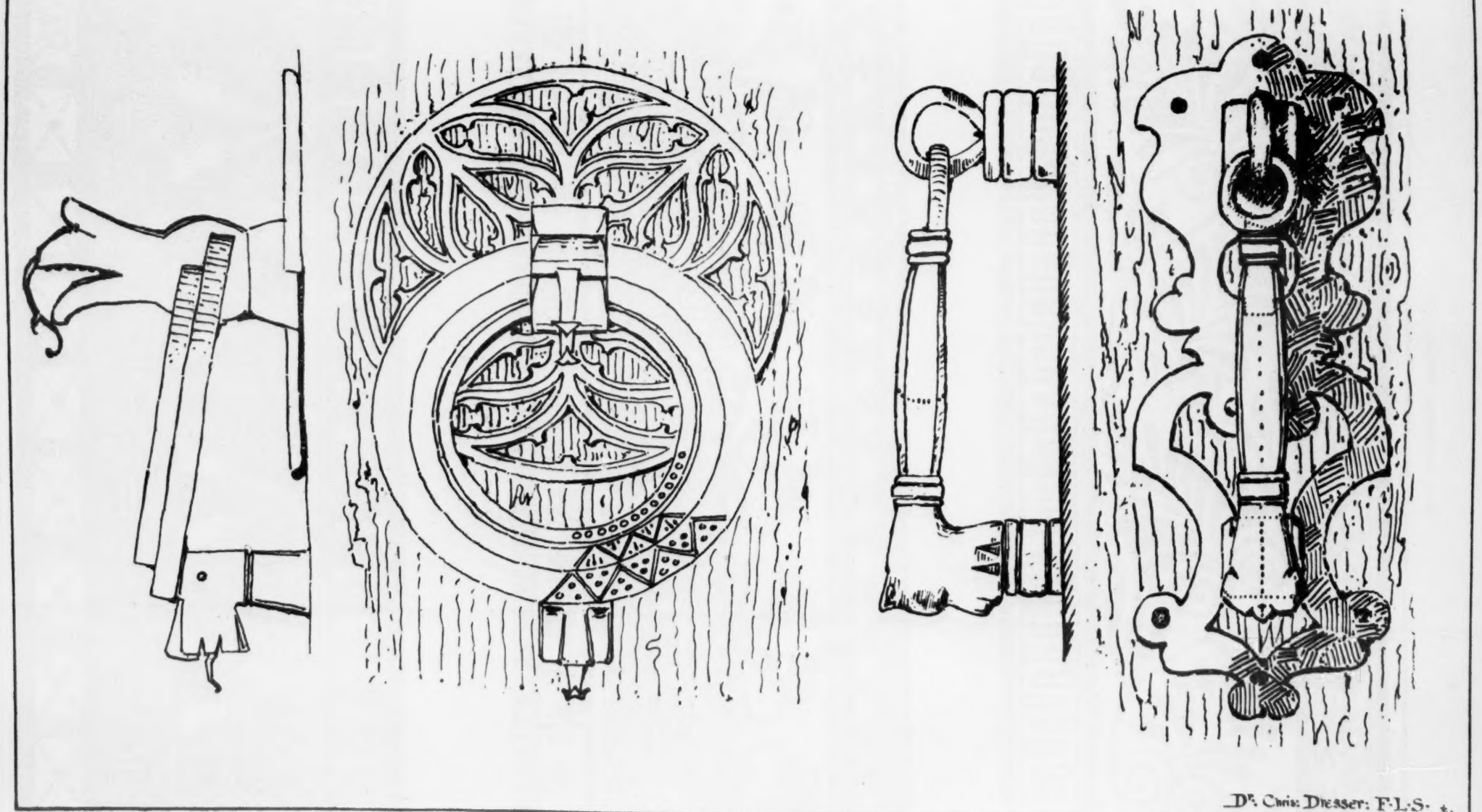
BANGOR CATHEDRAL: SKETCH FOR REREDOS.



Dr. Chris: Dresser: F.L.S. &c.

C.F. Hall, Photo-Litho. Castle St Holborn, London, E.C.

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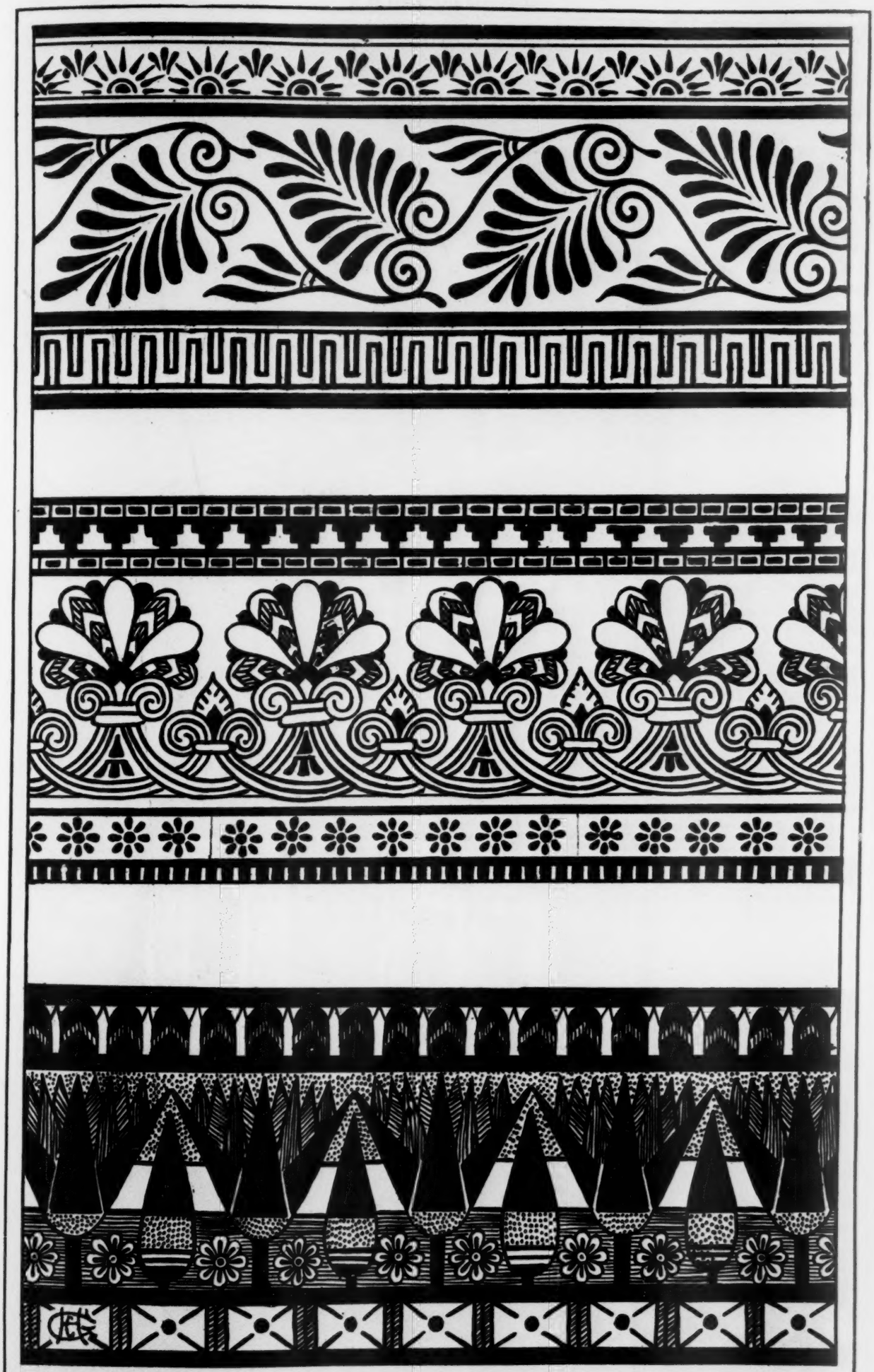
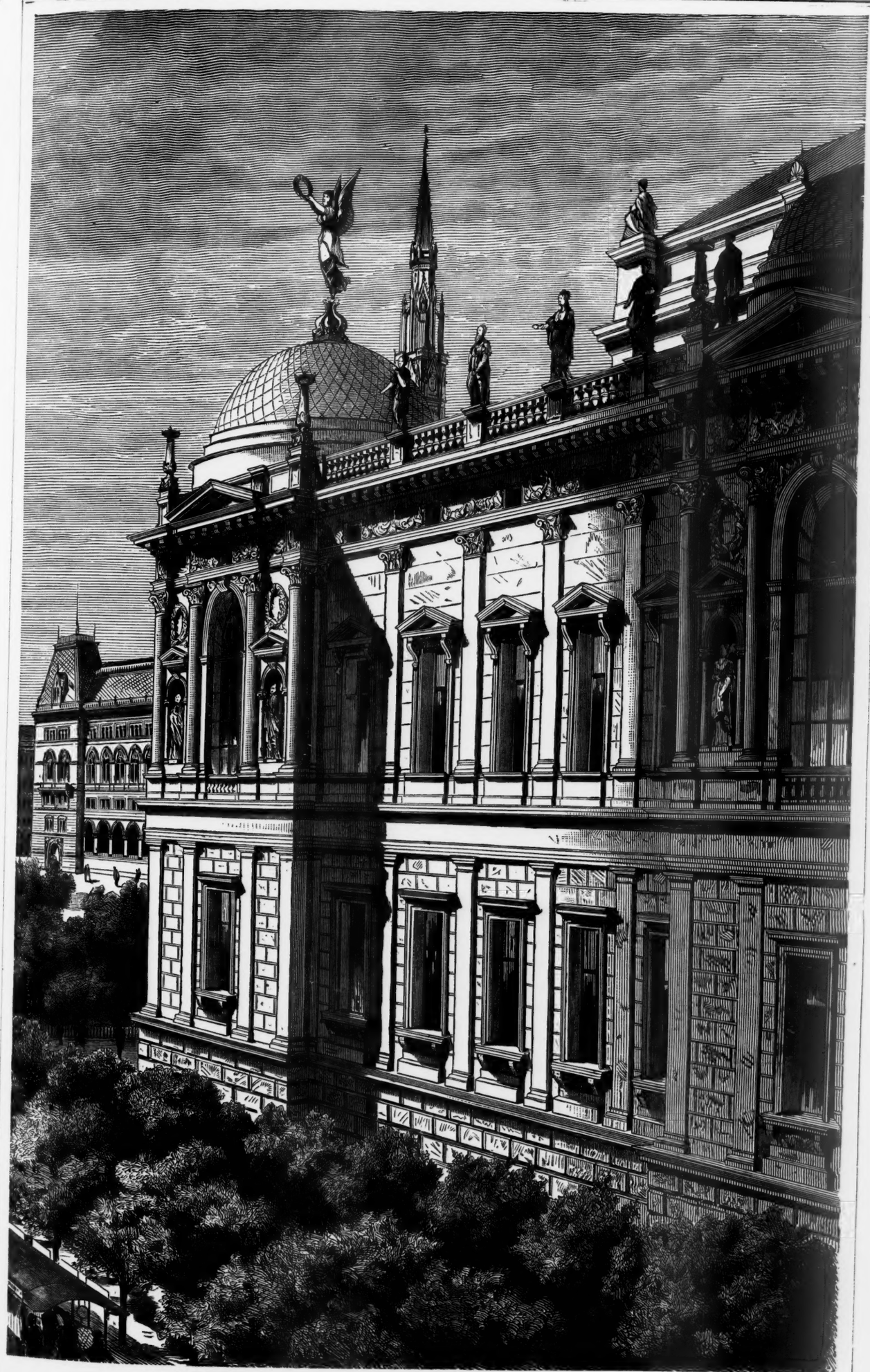
## Specimens of Spanish Iron Work.

REPRODUCED, WITH THOSE ON THE PRECEDING PAGE, BY "THE ART FURNISHERS' ALLIANCE."



Whiteman & Bass, *Photo-Litho* Wyman & Sons, Printers.

BORDERS.——Designed by Geo. C. Haite.



UNIVERSITY BUILDINGS, FRANZENSRING, VIENNA.

of stone being placed across them." No one who has visited the Lebanon district, or read Count Vogüé's book on Central Syria, can fail to perceive that the style of building which characterises these northern districts was the style used also in Moab and south of the Dead Sea, and that there are several chapters yet to be written in the art-history of the past, when these wild districts have been carefully explored.

T. HAYTER LEWIS.

## BAGSHOT CHURCH.

WE continue the history of this competition by illustrating the design submitted by Mr. T. Goodchild, F.R.I.B.A., placed second by the building committee, and to which a sum of 10*l.* was specially awarded.

It is of the Geometric period of Gothic, and consists of nave, with clearstory, north and south aisles, choir and sacrarium, organ-chamber, and vestries. It has a south porch, west doorway, and distinct entrance on the north side to the royal seats. A tower and spire are shown at the north-west angle, and as a sum of 400*l.* has been promised for bells, it is presumed that the erection of these would soon follow the erection of the main building.

The materials proposed to be used are local stone for the general body of the walls, and Bath stone for dressings, windows, arches, &c. The roof to be open-timbered in yellow deal, felted and slated, and Minton's tiles to aisles and chancel, &c. The church would seat 450 adults.

We understand a tender has been made by an experienced builder of churches to carry out the design for the sum to which competitors were limited, 3,000*l.*, without, of course, tower and spire.

## MOORISH IRONWORK.

ON one of our sheets of illustrations we this week figure two Moorish knockers which were forwarded to Dr. Dresser by an assistant, whom he sent to Spain and Morocco to make drawings and photographs of all kinds of Moorish remains. The most interesting things resulting from this visit to the two countries, in which specimens of old Moorish work are chiefly to be found, were the knockers, door-handles, nails, escutcheons, and other works in iron, some of these being very interesting, as well as appropriate, to our own wants at the present time. This being the case, the Art Furnishers' Alliance, of 157, New Bond-street, have made reproductions of these old works, and those who are interested in metal work may there see not only these particular things, but many other reproductions of an interesting character.

On a second page, for further examples, we give sketches of three knockers and one lock-plate. In Spain we find both Christian and Mahommedan art brought together in a curious way, and often meet with "Gothic" knockers which were either the work of Moorish metal-workers themselves, or of men whom they taught. Two of the knockers now figured, and the lock-plate, are pure Moorish works; but the one knocker with the dragon-like centre is of Gothic character.

## UNIVERSITY BUILDINGS, THE FRANZENSRING, VIENNA.

THE Franzensring is the latest development of the whole Ring of Vienna. In reality, it is not yet what it is to be, that is to say, completed; and it will hardly ever be like the other portions, which show masses of buildings displaying some uniformity of architecture, and which have merely added to their special names the generic term, "Ring." The plans for the parts to be joined on to the old town had long been designed,—in fact, had partly been finished,—when the large reserved space, the "Paradeplaz,"—the name of which showed it to be devoted to military purposes,—gave way to necessity. The capital, almost daily growing in extent, required a town-hall, the empire wanted a Parliament-house, as well as a suitable *alma mater*, a university. The idea of uniting all those and other grand buildings on one spot, instead of inserting them here and there between houses used for everyday purposes, was a grand one, which gradually grew in public favour; and the large open space used for military shows had to be sacrificed. More than that, the name itself disappeared; but a space was formed of which Vienna may be prouder than it was of its former Champs-de-Mars, especially as another sumptuous edifice was added, the Imperial Court Theatre. Thus the Franzensring unites within its bounds the grandest architectural specimens of the modern period of Vienna.

Let us see what the latter are. If we approach the Franzensring from the Burgring, the eye rests first upon the Volksgarten, with its temple of Theseus, next upon the Court Theatre, and in the distance upon a number of newly-erected gigantic palaces. To the left the eye beholds, receding from the front line, the finely-membered Palace of Justice; before it, the Houses of Parliament, in the Greek style, forming a flank of the Rathhaus Park; and in this park the town-hall, of Gothic architecture, one of the largest buildings of its kind in existence, and of which we have given our readers a view. The other flank of the park is formed by the University buildings, in the Italian Renaissance, a view of which we publish in our present number. The building to the left is a portion of the town-hall.

All these are buildings already in existence, to which large additions are to be made in the near future. Leaving out of the question, however, what is to be, there is enough to afford a most enjoyable view. From the Franzensring may be seen in the distance, on the one side the Gothic Votivkirche, with its pointed steeples of white stone; on the other, the new handsome cupolas of the museums and the marble statues surmounting their high parapets. If we come from the Schottenring, we have the Votivkirche to the right, and behind the future tower of the town-hall, the domes of the University, the pediments of the Parliament House, the cupolas and statuary groups of the museums, and around us the quick pulsation of the life of a metropolis, the confusion of quickly or slowly moving vehicles of all descriptions, and the human element in its ever-varying forms, a picture constantly presenting to the eye a thousand subjects for contemplation.

## REREDOS, BANGOR CATHEDRAL.

WE give a view of the proposed Reredos for Bangor Cathedral. It is designed by Mr. John Oldrid Scott, and is the gift of Mrs. Symes, its cost being nearly 600*l.* It is of oak, which will receive sufficient enrichment in gold to harmonise it with the decorations of the chancel. The work is being carried out by Mr. John Thompson, of Peterborough, the sculpture being by Mr. Bridgeman, who has done many of the figures lately placed in the west front at Lichfield.

It is hoped that the oak panelling will be returned several feet along the north and south walls, and be combined with sedilia.

## BORDERS.

THE plate shown is composed of three borders in leading styles, viz., Egyptian, Assyrian, and Grecian, the *motif* of the designs being supplied by the painted and carved ornaments upon the mummy cases, sculpture, and pottery, to be seen at the British Museum.

They are designed to repeat in as small a compass as possible, so that they may be the better suited and capable of management when used for rounded surfaces.

The bottom border (Egyptian) lends itself readily to the requirements of woven stuffs and fabrics; the second (Assyrian) more to that of carved wood, stone, or marble; while the top (Greek) seems most suited for flat-colour decoration or stencil work. They might well be used for a variety of purposes, as borders for carpets, rugs, curtains, and other fabrics, for wall decorations in stencil or printed work, for carved mouldings, edgings, and so forth.

G. C. H.

**Truro Cathedral.** — Considerable progress is being made in these works. Recently 150 tons of scaffolding were brought down by sea, by Mr. Shillitoe, the contractor. He has also just had a derrick erected,—somewhat a novelty in the south of England. Mr. Shillitoe, jun., is permanently settled on the job, and represents his father. Mr. James Bubb, the clerk of the works, is now recovered from his indisposition. The Bishop's youngest son, our informant adds, occasionally has a turn at the mason's banker, much to the delight of his spiritual and temporal father.

## PROPOSED NEW PUBLIC OFFICES, CHARING-CROSS.

THE Government appear to be at length in earnest with regard to the much-needed consolidation of the public offices, and have introduced a Bill into Parliament for the acquisition of the land necessary for the erection of the new buildings. The site selected for the purpose is bounded on the east by Whitehall and Charing-cross; on the west, by St. James's Park and the passage leading into the park adjoining the offices of the Metropolitan Board of Works; on the north and north-east, by Spring-gardens and the new banking-house recently erected by Messrs. Drummonds, and the banking-house of Messrs. Cox, Biddulph, & Co.; and on the south, by the Horse Guards and the Horse Guards' parade. It is also proposed to take the houses Nos. 53 and 54, Charing-cross, apparently for the purpose of affording a better entrance into Spring-gardens, and the house, No. 24, Spring-gardens, adjoining. The greater part of Spring-gardens, together with the passage therefrom into St. James's Park, and the small enclosed plantation upon each side of this passage, will also be absorbed, and is apparently intended to be built upon.

It will thus be seen that the site includes the Paymaster-General's office, the residence of the First Lord of the Admiralty adjoining to the north, the whole of the Admiralty buildings and the garden in the rear, the gunner's house and gun-shed, the whole of Spring-gardens, Spring-gardens-mews, and the streets formerly known as New-street, Spring-gardens, and Spring-gardens-terrace; St. Matthew's Chapel, together with the whole of the houses on the south side of Spring-gardens between the chapel and the passage leading into St. James's Park, five houses in Charing-cross (Nos. 37 to 41) north of Buckingham-court, and the houses on the east side of Spring-gardens backing upon the houses facing Charing-cross, as far as Drummond's Bank.

The houses fronting upon Charing-cross from the passage-way leading into St. James's Park to the street leading into Spring-gardens, with the exception of Nos. 53 and 54, Charing-cross, are not proposed to be taken. Messrs. Drummond's new bank, the Ship public-house, and Messrs. Cox's banking-house are not included within the limits of the land to be acquired.

The site will comprise very nearly the whole site of the famous resort formerly known as Spring Gardens, the site of Wallingford House, from the roof of which Bishop Usher witnessed the execution of Charles I.; the large house with garden in the rear, now numbered No. 18, Spring-gardens, and recently in the occupation of the Guest family, used as a temporary building by Messrs. Cox & Son during the rebuilding of their bank; and the house formerly the residence of the Speaker, Mr. Shaw-Lefevre, at the western end of what was formerly New-street. All these will be swept away, and the site will apparently be entirely covered with buildings.

It would seem as if the Government have abandoned the intention they lately entertained of placing the new offices to the southward of the present Foreign Office and the India Office. In the session of 1877 a Bill was introduced into Parliament for acquiring the whole of the land lying between the new Foreign Office and the India Office and Great George-street, extending to Parliament-street on the one side and to St. James's Park on the other. The Bill was not proceeded with during that session for some reason or other, but was reintroduced in the session of 1879, and again dropped.

The Great George-street site seems to have many advantages over the site now proposed in Spring-gardens, and it is difficult to assign any good grounds for the abandonment of the former site and the selection of the Spring-gardens site in preference, unless it be from economical reasons, which should not be paramount in determining such an important matter as the housing and concentration of several Government departments.

First, as regards convenience, the Great George-street site appears to be preferable, from its nearness to the Houses of Parliament and the official neighbourhood of Westminster. The Spring-gardens site is a little nearer the centre of London, but trenches upon a business locality, and the proposed Government buildings will be mixed up with buildings devoted to trade and commerce in a manner which seems to be highly undesirable.

It will be impossible to produce anything like an architectural effect in the buildings to be erected upon the Spring-gardens site. It may be assumed that the Admiralty and the Paymaster-General's Office will be pulled down, and on the site of these buildings, together with the site of the houses to the northward, which it is proposed to acquire, it will be possible to erect a building of sufficient importance, as regards size, to form a striking feature in the composition; but the elevation of this part of the design will require to be carried to a considerable height to avoid being overpowered by the commanding elevation of Messrs. Cox's bank, and will, in its turn, completely crush the appearance of the Horse Guards. The difficulty with regard to this latter building was felt by Sir C. Barry, who, in a design he made for the concentration of the whole of the Government Offices, proposed to raise the Horse Guards by the addition of an attic, with a large central dome, and to make that building the key-note of a magnificent composition, extending from Great George-street to Charing-cross.

Sir Charles Barry made a design for the grouping together the whole of the Government offices on the west side of Whitehall and Parliament-street, which is distinguished, as are all his works, by breadth, simplicity, and mastery of the subject. The key-note of the design is the Horse Guards, which was proposed to be retained and raised in height. On either side of the Horse Guards it was proposed to place a block of buildings slightly recessed, uniting the central block with the Admiralty on the north (which it was also proposed to retain with a new front addition towards the street), with the present Treasury buildings on the south. The whole of the buildings to the south of the Treasury, as far as Great George-street, were proposed to be removed, and a magnificent Government palace erected upon the site, with frontages towards Whitehall, Great George-street, St. James's Park, and the Horse Guards parade. The parade was proposed to be enlarged and a block of buildings erected on the north side, in the rear of the Admiralty, to balance the flank of the Government palace on the opposite side of the parade.

This was a really magnificent but a strictly conservative scheme, all the buildings which are really worth preserving being retained, and it is a matter for regret that some similar comprehensive plan for the distribution of the various offices cannot be agreed upon. The erection of the New India Office and Foreign Office has rendered the carrying out of this design impracticable, the scale of the new buildings making it impossible to utilise the old Treasury block as part of the elevation towards Whitehall, as Barry proposed.

A new roadway was also proposed by Barry from Charing-cross to the Mall, by which a direct communication would have been obtained from the Strand to Buckingham-gate in place of the present circuitous route. If the present proposal of the Government is carried, the formation of this road will be impossible in the future.

In 1854 Mr. John Tarring submitted a design to Sir Wm. Molesworth, the then Chief Commissioner, for an extensive pile of buildings for Government offices. In this scheme it was proposed to remove the buildings between the Horse Guards and Great George-street, Westminster, as far as Charles-street, as well as the block between King-street and Parliament-street. Dover House and the buildings occupied by the Board of Trade and the Privy Council were also suggested to be pulled down to form a new entrance into St. James's Park.

The block of the Treasury buildings, re-faced by Sir Charles Barry, was proposed to be retained and to form the key-note of the whole design. This block would form one wing of the proposed new buildings, and a similar wing would extend from about Fludyer-street to Charles-street, the intermediate space being filled in with a centre of considerable height. The whole frontage was proposed to be about 700 ft., and the buildings would be carried back for a depth of 400 ft., and the cost was estimated at 700,000*l.*,* and to meet the financial difficulties started, the persons proposing this scheme offered to carry it out, and present the buildings to the Government on receiving a sum of 32,000*l.* per annum for fifty years.

* The cost of this scheme must have been understated. Lieutenant-Colonel Clarke estimated the cost of his design at 4,000,000*l.*

This design was illustrated in the *Builder* for 1854, vol. xii., p. 641, and is distinctly better than the arrangement now in contemplation. It had the merit of simplicity, and greatly resembled Barry's plan without being a plagiarism of it.

It is difficult to see why the whole of the houses fronting towards Charing-cross, as far as Dent's, was not included in the site, unless, as we have before mentioned, upon the ground of the expense. If this had been done, a continuous frontage might have been obtained, extending from the Horse Guards to the passage leading into St. James's Park, and upon this a building might have been erected of sufficient importance to compete with the huge overwhelming mass of the Grand Hotel. Upon the site as scheduled this will be impossible.

The difficulties as regards light and air are not to be overlooked. The Government having obtained a Bill for the acquisition of the site, will probably be safe from mandatory injunctions as regards their buildings, but they will not, we opine, be exempt from actions for damages, and it is possible that the light of some of the houses in Carlton-terrace and the offices of the Metropolitan Board of Works may be prejudicially affected in case buildings are erected of any great height at the north-west corner of the site.

There are some peculiarities in the outline of the site which give colour to an apprehension that the Government do not intend to employ an architect for the erection of the buildings, but that the works will be designed and carried out by the Office of Works. Lieutenant-Colonel Clarke, R.E., the Director of the Works in the Admiralty, prepared a design in 1869, which was submitted to Parliament for the arrangement of the whole of the public offices, in which he proposed to accommodate the Departments of War and Marine, the Commander-in-Chief, First Naval Lord, with three secretaries, on the Spring-gardens site. This design was illustrated in the *Builder*, vol. xvii., p. 201, and an examination of this plan will show a remarkable identity between that design at the south-west angle and the site now scheduled.

The probability is that the Government intend to build a kind of barrack without any architectural impress, and they will shelter themselves from accusations of the impropriety of this course by dwelling upon the economy that will be effected by this method of dealing with the question, and the impossibility of composing a properly-designed front towards Charing-cross upon the limited site at their command. It is difficult to avoid the conclusion that the whole matter has been pre-arranged; as, if it had been otherwise, and the Government had intended to construct a building worthy of the nation, why was not advantage taken of the rebuilding of Messrs. Cox's bank and, more recently, of Messrs. Drummond's, to acquire the sites of these buildings?

It is to be hoped that some explanation will be required by Parliament of the intentions of the Government with regard to this important step in our national history before the money for the purpose is voted; for, after the money is obtained, remonstrance will be unavailing. A distinct pledge should be obtained that the buildings shall be of an architectural character; that they shall be designed by, and superintended by, an architect; and that the strip of open ground in front of Spring-gardens-terrace, which virtually forms a part of the park, and would serve a most useful and improving accessory to the buildings as seen from the park, should be preserved as an open space, and should not be absorbed into the building site.

**Gates and Bars on Private Property.**—There seems some hope that the days of these nuisances are numbered. At last week's meeting of the Metropolitan Board of Works, a letter was received from the Home Secretary, requesting, in pursuance of an order of the House of Commons, that a return may be prepared and transmitted to him of all gates, bars, rails, and posts situate on private property in the metropolis, which obstruct the free passage of vehicles in the streets, and a copy of correspondence, if any, which may have taken place between the Vestries and this Board, or between any of the Vestries and the owners of, or persons interested in, such gates, &c., with a view to their removal. It was resolved that the return asked for should be prepared and presented to the Board.

## GODS AND GIANTS IN GREEK ART.

THE fourth lecture of the series given in support of the Society for the Protection of Ancient Buildings was delivered on the 16th inst., at the Vestry-hall, Kensington, by Professor Sidney Colvin, M.A., who took for his subject "The War of the Gods and Giants: a Chapter in the History of Greek Art."

Professor Colvin said that his object in coming there that day was to try and interest the audience in a great work of restoration which had recently taken place. Restoration was a word which had an ominous sound in some of their ears; but there was restoration *and* restoration. There were some people who were fond of constituting themselves guardians of existing monuments, and they were never satisfied until they had taken away in them what was venerable only, leaving what was vulgar; but there was another class of people who took an interest in monuments which had been overthrown, and which were of past civilisations. They went with spades, and probed among the mounds and sandhills of ancient glory for traces of those monuments which might still lie below the surface. [Some day, perhaps, the spade touched marble, which would be taken out of the ground more or less in a fragmentary condition, the soil being found filled with the work of men of past generations. These specimens were brought away, and served to enrich museums and other storehouses of the civilised world. That was what he called real restoration, and if they could only get people to be determined upon this admirable undertaking of recovering lost and buried monuments of the past, the world would be gainers. There were many interesting works of restoration of that kind which had been done of late years, and it showed its great importance, as the result had been so valuable, rich, and startling. Especially had this been the case at the excavations lately carried on at Pergamos, which still retained its ancient name. It was now a small town, peopled half by Greeks and half by Turks, but it was once a flourishing town in Asia Minor, on the navigable river Caicus. Here was the famous Acropolis. At a critical epoch in the history of the world, there rose up in this city a new civilisation and a new dynasty, rising into great prosperity and importance under Attalus I. Attalus won his fame as a warrior by a mighty overthrow of his enemies. He afterwards joined policy to valour, and kept friends with the Romans, and his kingdom became the richest possibly that down to that time had been inhabited by any of the Greek race. He ruled over a mixed population, half Greeks and half Asiatics, and his wealth was proverbial all over the world. Not only were his subjects wealthy, but they were men with considerable education; they surrounded themselves with libraries, pictures, and sculpture, especially the latter, which was the most original and richest school which then existed. High above the city stood the great Acropolis which was dedicated to the worship of Zeus and Athene. This great plateau was formerly covered with buildings of the richest and most gorgeous description. The great altar then smoked incessantly. The days of the glory of the city were between 260 B.C. and 240 B.C. The whole of the kingdom did not endure for more than 150 years, after which it was bequeathed to the growing, all-devouring empire of Rome. All the glories of Pergamos and its Acropolis were obliterated until the other day. About four years ago a German engineer was struck by the appearance of the place, and began excavating. He soon received help from the German Government, who were always ready to help in this kind of work, and in the course of the excavations a store of antiquities was recovered, the most interesting being the carved slabs of an interesting frieze that used to run all around the wall below the colonnade. The figures were carved in rich relief, and a great quantity of the frieze had been sent to Berlin. The restoration of the parts would occupy skilled hands for a considerable time.

The subject of this great frieze was "The War of the Gods and Giants," and the character of it was extremely singular in Greek art, the whole design being full of various inventions. Some of the giants represented were winged, while others, instead of having human terminations, were represented with snaky folds; they were placed all along the frieze, and were shown to be in deadly encounter with their opponents, the Hellenic gods and others. There was no work of art so full of turmoil or so replete with

an amount of violent ferocious invention in itself. Immense accuracy and knowledge were shown in the treatment of the muscles of the combatants. The drapery flowed in lumpy lines, while the hair was represented in rich and loose curves, the whole feeling and conduct of the work being different from the Greek art. Then, in the character of the heads, some were contracted as in despair, while others,—a youthful beauty,—showed expressions of defiance, recalling the account of Milton's fallen angels. One immediate result they got from a study of this frieze was that the famous Laocoön group had been inspired by the school of Pergamos; another result was that after a comparison with the frieze and other works, they would have to re-name a number of statues and busts which were scattered about in various museums, because they now had the materials of tracing affinities between this great frieze and sculptures which had been called different names. As to the "Battle of the Gods and Giants," they knew that almost all nations had legends of giants and huge primeval men, of whom fanciful stories had been told. In the background of the imagination of nearly all civilised people remained the ideas of the primeval race of huge men and giants. In fairy tales they had been told about giants, but the Greek thoughts about them were far more of a serious kind. In the imagination of the Greeks there had been a great and portentous conflict between the gods of their religion,—the Olympian gods,—and those primeval races of gigantic men. The story ran that the earth mother, Gè, having taken a spite against the Olympian gods, urged her giant sons to overthrow them. It was a terrible warfare, and it had a treble meaning. In the first place, it had a physical meaning, viz., that the explosive nature of the earth, the impressive force of the earth's violence, was opposed to the peace and majesty of Heaven. Then came the moral meaning. It was a warfare of anarchy, darkness, lawlessness, and violence against order, law, purity, and life. Next came the political meaning, which showed the warfare of Greece against barbarism, it being symbolic of the gods fighting against the invading hordes. The original physical meaning had probably been lost by the Greek mind very much, but the other two meanings were ever present to them. Whenever the Greeks carved or painted a subject they had always present to their minds the ever momentous feeling of good over evil. That being so, it was natural that they should paint this great battle subject on their monuments, so the battle of the gods and giants was found to be a favourite one. The lecturer then proceeded to refer to a number of places where this subject was treated, and exhibited some drawings illustrative of his remarks. He contrasted the styles of the earlier Greek with those of a later date. The former, he said, showed the "severe" time of Greek art, and were quite different from the treatment of the works of a later date. Outside the shield carried by the goddess Athene was a representation of the battle of the gods and giants, which was the work of Phidias.

In the minor form of the art they had a number of examples to be found in the painted vases, some of the museums containing excellent specimens from the earliest and rudest times down to others of a later date. Illustrations were shown of the earlier examples, some of which dated from 500 B.C., the treatment of which, he said, was very rigid, while later ones showed careful and scrupulous finish. In the early art, both in sculpture and vase painting, giants were uniformly represented; but in later works Greek warriors were no longer shown as fighting with spears and shields, they in the main being naked men of wild aspect.

In conclusion, the lecturer hoped that those present would carry away with them some idea of the examples which he had set before them, and that they would feel the immense importance of the work of the restorer in bringing to light specimens not of the purest of Greek art, but the best of original Greek art in its decline. He hoped they would feel the merits of such a subject, and take an interest in a "Chapter in the History of Greek Art."

**Artists' Benevolent Fund.**—The anniversary dinner of this important fund will be held at the Freemasons' Tavern, on this Saturday, the 25th of March, when the Right Hon. W. H. Smith, M.P., will preside.

## "THE DESCENDANTS OF THE RENAISSANCE."

ARCHITECTURAL ASSOCIATION.

AT the meeting of this Association on the 17th inst., Mr. Aston Webb, president, in the chair, Messrs. H. Gilbert, H. W. Rising, W. Davis, and A. Robertson, were elected members.

Mr. Hugh Stannus then proceeded to give a lecture, illustrated by numerous engravings and photographs, on "The Descendants of the Renaissance." He explained that the short notice at which he had undertaken the duty, and pressure of other business, had prevented his preparing any manuscript, and he would ask their indulgence for what he would term a "Gossip to the younger members." He observed that in what he had to say he did not want to provoke any discussion about the battle of the styles. According to Mr. Ruskin's beautiful poetic simile, the later styles of architecture were, so to speak, the daughters of the former; but if, as he should show, the daughters of the Renaissance became afflicted with a very serious and ineradicable disease, it was through no fault of the mother. The Renaissance in its purest form flourished only during the comparatively brief interval between the years 1480 and 1510 or 1520. During that period he thought that the Renaissance was just as lovely and perfect in its way as was the finest Early English or the purest Greek. Unfortunately, it early became corrupted. In other words, it became afflicted with a disease which he could only liken to scrofula, but whereas that terrible disease did, he believed, sometimes die out from among human families afflicted by it, the scrofulous disease which afflicted the Renaissance never died out. From very small beginnings it spread itself all over the face of the work affected by it, and the fine work of the Quattro-cento period degenerated from bad to worse until the culmination of badness was reached in the time of Louis Quinze. It might be asked, Where did the evil begin? And he would endeavour to show this by tracing it to its source. One example which showed the beginning of the disease was a ceiling designed by Primaticcio, one of the Italian artists imported into France by Francis I. In that design one of the small mouldings was treated in what could only be called a plastic manner, being broken and turned up into volutes at the ends and in the centre of each side of the panel. That was, in the opinion of some people, a very pretty thing to do; but it was not the proper treatment for mouldings. It was a thing certainly calculated to catch the eye of the observer; but, as Ruskin said, when a thing caught one's eye there was something wrong about it. These curlings on the borders of panels were certainly an unconstructional feature, and they soon increased in fretfulness and in power to distract the eye, becoming at the same time increasingly unconstructional. In the Venetian Cinque-cento work the volutes and curls became rampant. In the Great Hall of the Council in the Ducal Palace at Venice, the whole of the ceiling was one sprawling, wriggling mass of abominably-contrived and shaped picture-frames, richly-gilt and surrounding a great deal of good art. The ceiling showed very high technical skill on the part of the workmen in the shape of wonderful carving and magnificent gilding, but it was good work thrown away on a bad design. In it the frame-maker seemed to have run riot, and the whole might have been done in compo with equal effect. It was not constructional. The Church of the Miracoli at Brescia had been utterly spoiled by having its ceiling covered with some abominable rococo "ornament," done by some person in the seventeenth century. Although he was a member of the "Anti-Scrape,"* he thought good excuse might be urged by any one who, having that church to restore, should wipe out the whole of that rococo work, which so spoiled the church as to enable the observer to realise what the late Mr. Street, with his large experience, must have felt when he said that he longed to restore aright many churches which had been thus maltreated. It would perhaps be said to him (Mr. Stannus) by his brother "Anti-Scrapes" that if one were to wipe out the work of which he was speaking it would be wiping out history. Well, there were some kinds of history which might be better wiped out. In France, as in Italy, the disease of which he had been speaking affected other materials as well as stone, and other arts besides architecture. Continuing his remarks, which were entirely *viva voce* and without notes, Mr. Stannus pointed out the characteristic detail of each phase of French Renaissance from François Premier to Louis Quinze, and of contemporary German, Italian, and Spanish work; and he remarked upon the great amount of attention paid by the French at the present day to correctness of detail in modern works designed in any of these seven phases; and he said that, just as Mr. Eastlake speaks of a critic who would damn a moulding if it were "half an hour too late," so the Frenchman would condemn anything if it were not in exact accordance with the style which obtained when its original was executed. In the last French Exhibition the French works exhibited a mere *réchauffé* of old French styles, while, on the other hand, it was encouraging to see how thoroughly national and alive was the art displayed by the English exhibits. That the French styles were known by the names of the monarchs who lived when they were practised was one of the inherent weaknesses of those styles. The architects and ornamentists of those days were mainly supported and patronised by the king and the nobility, but that support and patronage were given by king and nobles not from any love of art for art's sake, not because they loved beautiful things, but because they wished to add to their own aggrandisement and magnificence. The architect and ornamentist of those days was simply a superior kind of court servant. The French were fond of speaking of their kings, and the Italians of their popes, as the great patrons of art, but the kings and popes were not thinking of art at all: they were merely thinking of adding to the splendour of their churches and palaces. Undoubtedly the lowest sink of corruption which the Renaissance reached was the style known in France as that of Louis Quinze. Students of history were familiar with the fact that the court of Louis XV. was foul and corrupt in the extreme, and the style of the ornament which prevailed was in accord with both the licentiousness and lasciviousness of the time. It was rampant and utterly devoid of repose, consisting mainly of curls and scrolls. Straight lines were conspicuous by their absence. In conclusion, Mr. Stannus said he thought there existed a good chance for the pure Italian style which many of our best architects were now desirous of seeing employed in England. The patronage of architects was more in the hands of the great middle class, who needed large and important buildings for commercial and other purposes. This class largely consisted of clearheaded men, with, in the main, sensible ideas as to building, and they would not build merely for their aggrandisement or gratification. It was to the middle class that he thought architects must look for the future patronage of architecture, and, by due guidance on the part of architects, the buildings which were erected to meet modern necessities might be made pure in style and reasonable in all respects.

We have only given the heads and the salient remarks in an address which was illustrated by constant reference to the engravings (some from our own pages) exhibited, and to many sketches on the blackboard, and which was listened to with great attention.

We postpone our report of the discussion.

* For the information of some of our readers, we may say that this is a friendly, if not comprehensive, nickname for the Society for the Protection of Ancient Buildings.

## THE ELEMENTS OF ETCHING.

THIS was the subject of an interesting lecture delivered on the 13th inst. by Mr. F. Seymour Haden in the theatre of the London Institution, Finsbury-circus. The lecturer observed that three years ago he delivered at the Royal Institution of Great Britain three lectures upon etching.* Those lectures, like the present one, were unwritten, but they were so far thought out as to cover the whole of the ground legitimately appertaining to the subject. Those lectures were purely of a technical character, and addressed for the most part to engravers and experts, as well as to all who had engaged themselves in the practice of etching, or who took an interest in the subject. The present lecture, however, would only deal with the elements of etching, and would be, he hoped, acceptable to those who had not as yet given much attention to the subject. He proposed to divide the lecture under three or four heads. He would, in the first instance, speak of the

* See *Builder*, vol. xxxvii., p. 431.

principles of etching, more particularly upon the capital principle of etching, and would show the difference between etching and engraving. In the second place, he would describe the mode of practising the art of etching. Thirdly, he proposed to say a few words upon the printing of etchings, more particularly with regard to two practices in connexion therewith known as *retroussage* and *acierage*. In conclusion, he would speak of the value of a collection of etchings, and would say something as to the disabilities under which etchers laboured at the present time.

Before speaking as to the principles which should govern the art of the etcher, he would first of all give his definition of what he meant by an "art." The French say "*arts et métiers*," the English saying "arts and manufactures," neither nation, however, using the terms very exactly. "*Métier*" meant the mastery of some craft or trade; "manufacture" clearly meant, or should mean, something made by hand; but it was the rule, in speaking of "manufactures," to mean goods made by machinery. In that way the term was misapplied. He wanted to define the difference between an art and a *métier*, and between an art and a manufacture. An art differed from a *métier* in that, though it depended upon certain material agencies for its final expression, yet those agencies, like the brush of the painter, were of the simplest kind, and were wholly directed to their end by the impulse originating in the brain of the artist. On the other hand, to invest any of those simple agencies,—the brush of the painter, the needle of the etcher, the pencil of the designer, the knife of the surgeon, the chisel of the sculptor, the pen of the author,—with any of the attributes of a machine, or, in other words, to render them in any degree automatic, was to make brain-power or impulse unnecessary, or to put it into abeyance, with the result of producing, not an art, but a manufacture. Now, there were many general principles relating to art. Some of those principles were common to all branches of art, but there was one capital principle which was pre-eminently essential to etching, viz., personality, originality, ideality. That was, in fact, the initiative faculty required by the etcher, who must, if he would succeed, be imbued with poetry, imagination, sensibility, and all the qualities that went to constitute the genius of the artist. Now the work of the engraver did not call for the possession or the exercise of any of those qualities; for if he was not a mere copyist, he was at any rate only a translator of other people's ideas. Very ingenious, very respectable, no doubt, was the *métier* of the engraver, but it was, after all, only a *métier*. The engraver not only copied what he had before him, but he had to work in accordance with a whole gamut of formulæ (dictated by practical conditions) concerning the production and distribution of curves and lines. It was the use of these formulæ which made all engravings more or less alike; and it was the absence of such formulæ, and, indeed, of any formulæ, which accounted for the fact that no two etchings were alike. All methods of engraving on metal, whether by the burin or by the etching-needle, whether mezzotint or aquatint, were included in the term "painter-etching." The artist was not to be confined to the etching-needle, but if he used the burin he must use it as a means of original art expression, just in the same way as the etching-needle had (of necessity) to be used. Albert Dürer, as we know, preferred the burin, and used it with wonderful effect, but all his engravings were made by him from drawings previously made by him, every line of the drawings being reproduced. Therefore, Dürer, in engraving from his own drawings, used the burin as a means of original art expression. Rembrandt, on the other hand, preferred to use the etching-needle.

Proceeding to speak of the practice of etching, the lecturer said that etching, in the common sense of the word, was engraving by corrosion. The word was, he understood, derived from a Scandinavian word signifying "to eat," and corroborative of that etymology was the fact that the etcher spoke of "biting" his plate. In the common process, the plate of copper or zinc was first coated with a protective varnish. The picture was then drawn with the etching-needle, which removed the varnish down to the surface of the metal. The plate was then immersed, and allowed to remain for an amount of time dependent on circumstances, in a bath consisting of a solution of nitric acid or chlorate of potash. The parts of the plate unprotected by the varnish, or, in other words, the parts which the etching-needle had traversed, were rapidly acted upon by the acid. There were, as a matter of fact, two processes of etching, the first known as the "interrupted" process, and the other known as the "continuous" process. The interrupted process was that in which the gradations of shade in the plane of the picture were obtained by alternate "bitings" and "stoppings." When it was thought that certain lines in the picture had been sufficiently bitten in, the plate was taken out of the bath, and those lines stopped with the wax. By the continuous process, which the lecturer himself practised, the same results were obtained without the removal of the plate from the bath. In this process,—for which the lecturer said he had the credit, although he did not believe he originated it, but was firmly convinced that Rembrandt employed it,—the plate was put into a shallow bath, and the etching-needle was used on the surface of the plate while the latter was covered with the fluid. Under these circumstances the first scratch made by the needle would be the strongest in the picture, and the last one the faintest, and these were considerations which the etcher using the continuous or "synchronous" process, as it had been called, had to bear in mind. Writers on the subject of etching had described that process as very difficult, but he had not found it so. If the etcher knew what he was about, the continuous process was really the easier of the two. The lecturer then proceeded to point out the difference between the engraved line, as made with the burin, and the etched line. The engraved line was in section like the letter V, and consequently, as the surface of the plate was worn down by printing from it, the groove became shallower, consequently retained less ink, and, consequent on that again, the more worn the plate became the greyer were the prints obtained from it. Notwithstanding this disadvantage, however, the engraved plate had the advantage of great durability, for a very large number of impressions could be obtained from it. On the other hand, an engraved plate could not be, in an artistic sense, what an etched plate was, and for this reason: an etching was the work of the artist himself, and the process not being a laborious or mechanical one (as the etching-needle was used with the same freedom as a pen or pencil), the artist had full play for his fancy, and hence an etching must show the individuality of the artist. Thus it was that no two etchings were or could be alike. The use of the burin, on the contrary, was necessarily laborious and mechanical, rendering it impossible for the user to "invent" as he proceeded with his work. It was true that, as he had said, Albert Dürer had made good use of the burin, but even he had found it necessary, owing to the technical limitations of engraving, to make careful drawings beforehand of what he intended to engrave, and those drawings were copied by him, line for line, in his engravings. While, however, an etching was far superior to an engraving from an artistic point of view, compared with an engraving it possessed a very low degree of durability. The acid or mordant, entering the lines scratched by the needle on the surface of the plate, undermined, so to speak, the substance of the copper, so that in section each line in an etched plate resembled, roughly speaking, the letter O with an opening at the top (the line traversed by the needle), thus O. It would thus readily be understood that each of the channels thus eaten away by the acid had a sort of overhanging roof in two halves, unconnected in the centre, and of course the roof thus formed got more or less broken-in after a very few impressions had been taken, and the plate thus lost its sharpness, and the proofs their clearness. Having described the process of *acierage*, or steeling over the surface of an etched plate from which it was desired to take a large number of impressions (the effect of which, however, was to give the prints a dry and hard appearance), the lecturer referred to what he called the vicious practice of *retroussage*, which consisted in dexterous manipulation on the part of the printer (by direction, of course, of publishers and others) so as to hide the defects of an imperfectly-etched plate. Where a plate was found to print too light or too dark in parts, it was possible, by means of retouching or re-wiping, to so distribute the ink as to make a passable print from an artistically defective plate; but this, although it called for the exercise of much cleverness on the part of the printer, was not a commendable practice. In conclusion, the lecturer referred to the disabilities under which painter-etchers laboured at the present time. These consisted of the frauds practised by some unprincipled printsellers, to the detriment of the public and to the loss of the artists, and in the inexplicable refusal of the Royal Academy to hang on its walls a single original etching, although it had no hesitation in admitting engravings copied from pictures, and some of which engravings had been published for months past, and exhibited in the shop-windows. As President of the Society of Painter-Etchers, he felt bound to publicly protest against the continuance of this state of things.

## UNDRAINED LONDON: A FOG-FACTORY.

SIR,—The season of sulphurous fogs having virtually ended, it is not improbable that the lessons of this winter may be forgotten, and that next November may find scientific authority nearly as unprepared to give the true reasons for our recurring local pest as our local administrations are to provide a remedy for it. A common belief seems to prevail that the London fog is a sort of cloud, blown into the metropolis from distant marshes or a melancholy ocean. Some people think that the Thames is largely responsible for it; others attribute it solely to the use of coal and the non-consumption of smoke. But no one ventures to suggest the possibility of fog being generated at our very feet, on the many square miles of open spaces to be found within the London postal district. In this province of houses there is hardly one that does not possess, in front or behind, and sometimes on both sides, its portion of undrained land; and in support of a somewhat bold assertion I beg leave to offer for your consideration a few facts.

The London house was imported from France after the Great Fire, and it was but slightly modified by Dutch and German influences. In its highest type it was the *hôtel entre cour et jardin* of the seventeenth and eighteenth centuries. Burlington House, before it was converted to its present uses, was a conspicuous example of the Parisian arrangement of plan. It had a paved courtyard in front, with offices on each side; behind the house was a garden, laid out in level plots of damp grass and beds of black mould. Other similar houses, still erect in Piccadilly and elsewhere, retain the same characteristics; in a few, the forecourt was simply gravelled, and shrubs and trees were planted around. In smaller houses, built in squares or terraces, the forecourt was a mere open space, still to be seen in Lincoln's Inn-fields; as time wore on, it degenerated to a sunk area, but in all cases the garden was preserved at the back. The houses in Portland-place, and in the streets out of it leading westwards, in the many streets parallel with it, possess, with few exceptions, a back garden or yard. The Euston and Marylebone roads are, or were, bordered with houses, each with its patch of open space belonging to it in front and its patch of open space behind. In the great highways leading to the suburbs, every house is, or was, arranged on this plan, and a glance at the Ordnance maps will show that the systematic division of forecourt or sunk area, house, and garden, is universal in the metropolis, a small portion of the very heart of town alone excepted. Hardly one of these moist yards or so-called gardens is surface-drained, as half a wet day suffices to prove. The rain falling upon them, the pools of water collected upon them are duly absorbed, and as duly returned in vaporous exhalations.

No city in Europe is even now more distinguished than London for its many planted squares, and some of these have recently been improved by a little care judiciously expended upon them. But their level plots of damp grass have not been drained, and their sparsely-planted beds of black mould are neither more nor less than sponges for holding moisture. The London mews is another indigenous institution, which may also be studied with advantage in the neighbourhood of Portland-place. These often intricate avenues of stables and coach-houses are not absolutely undrained; above and below the rough paving-stones are rude channels, whereby liquid and solid refuse is carried to the sewer. But only a portion of the sewage running, and the rain falling, upon those stones, reaches the sewer; the remainder sinks into the wet earth beneath, while a comparatively minute portion filters into the cellars and kitchens of adjoining residences. The disused graveyards are also a prolific cause of fog.

They are to be found in all parts of the metropolis and in the City, but it will suffice for my purpose to mention one in the vicinity of High-street, Marylebone, where the rich earth of human remains, buried with orthodox euphony as "dust to dust, ashes to ashes," exudes perpetual moisture. Finally, the metropolitan parks are immense fog-factories, of which the most industrious is the Regent's Park.

The law favours, and has long favoured, the creation of fog-factories both within the metropolis and around its entire circuit. By the 29th section of the Metropolitan Building Act, 1855, every new dwelling-house is compelled to have "in the rear or on the side thereof" a certain extent of open space "exclusively belonging thereto," and, as a rule, a much greater extent of private open space is left around new dwelling-houses than the law requires. But neither in the original Act, nor in the Metropolitan Management and Building Acts Amendment Act, 1878, nor in the By-laws made thereunder, is there any mention of the necessity of surface-draining such open spaces. Thus, along hundreds of miles of suburban roadway, when land, hitherto used for agricultural purposes, and naturally, and often scientifically, drained, has become "building land," a large portion distributed as gardens has been left without any surface-drainage at all.

Daily and nightly, a vapour more or less perceptible to the eye, according to the hour or the season, rises from the parks and public gardens, from the many planted squares, graveyards and mews, from the yards or gardens of almost every dwelling-house, and from a thousand other undrained surfaces. The London atmosphere is never free from moisture or mist. David Roberts painted it, and I am credibly informed that Mr. Ruskin admires it. This mist, mingling with the coal smoke, at times develops into sulphurous fog, the character and duration of which are perhaps affected by extraneous influences, though I venture to think that the first cause of fog is to be found in the vaporous exhalations of numberless undrained spaces in London itself; and as these exhalations are more or less considerable in volume, so is the after-fog more or less sulphurous and dense. Smoke-abatement crusaders are soaring heavenwards, and they have already succeeded in proving the superiority of anthracite coal and thrice-wonderful stoves, but the promoters of a no-fog movement must be content, for many a long winter yet, to bend their faces to earth: the problem before them is the old unsavoury one of sewers and drains.

I have particularly alluded in this letter to the neighbourhood of the Regent's Park, for hardly any part of town offers to the statistician a more prolific field of inquiry. The park, possessing a very heavy soil, was drained, so to speak, some thirty years ago, on a system which has admirably prepared it for scientific surface-draining. If the officers of the Meteorological Council, already engaged at St. Bartholomew's Hospital in collecting fog statistics, would extend their observations to the Regent's Park, a step would be made in the right direction. The three public bodies having charge of the Park, its houses and its gardens (some of which, I am told, have been recently drained), would hardly fail to agree in permitting such statistics to be collected. Whether, when the cause of the fogs which are native to this neighbourhood is definitely ascertained, they would be in a position to apply the proper remedy, is another matter. By an apparent freak of administrative logic, the main body of the *Park* is under the jurisdiction of the Office of Works and Public Buildings, the *houses* around are managed by the Office of Woods, Forests, and Land Revenues, and the *gardens* by the Crown Estate Paving Commissioners,—a division of control, however, not more anomalous than is enjoyed by other portions of the capital.

WILLIAM H. WHITE.

*Conduit-street.*

## BIRMINGHAM ARCHITECTURAL ASSOCIATION.

AN ordinary meeting was held on Tuesday evening, the 14th inst., at the Rooms, Queen's College. Mr. Enoch Wood presided, in the absence of the chairman, Mr. McConnal, and there was a good attendance. After the business, a paper on "Statues and Monuments" was read by Mr. J. William Tonks. A discussion followed, and a hearty vote of thanks was accorded to Mr. Tonks for his very interesting paper.

## AN ARTIST'S VIEW OF THE SMOKE QUESTION.

REPLYING for "Art" at the dinner given by the Lord Mayor, to which we alluded in our last,

Sir F. Leighton said:—I have to offer my most sincere thanks to my friend Mr. Sala for the eloquent and picturesque terms in which, *more suo*, he has brought before you the toast of "Art." I thank you, my Lord Mayor, and this distinguished audience, for the kind indulgence with which you have received this toast. I confess I am anxious to withdraw my personality altogether from your notice, and to make my few remarks have a bearing on the matters which have assembled us here to-day. In the name of those arts which have been so graciously acclaimed, I desire to join in protesting against what I shall venture to call the crushing curse under which the inhabitants of our great city groan during the better part of the year. I am filled, however, with a keen sense of the absolute superfluity of any such expression in my mouth. Surely it is obvious enough that among the melancholy millions who grope their darkling way through our English winters none suffer so much under this smoke pest as the members of the community to which I belong, and for which I have now the honour to speak, in spite of those advantages to which the American Minister so amusingly alluded. Whilst the infection which emanates from the tainted breath of that smoke pest fastens upon us artists just as it does upon you, and whilst, in common with the rest of you, we wheeze, we cough, we gasp, we choke, and occasionally we fairly flicker out like the rest of you, we are further and especially attacked and paralysed in the heart and centre of our intellectual activity; for we live by the suggestive imitation and presentment of that which is revealed to us by light,—and by light alone,—and made lovely by its splendour. To us, therefore, the quenching of light, the blotting out of colour, is an approach to the drying up of the very life springs from which we are fed and set in motion. The list of our grievances would be long, and would be wearisome, but many a brother painter must regret with me the interminable hours, days, and weeks of enforced idleness spent in the continuous contemplation of the ubiquitous yellow fog, depressing the spirits all the more for recalling the memories of distant lands, where the sun shines in the sky, and sheds its gold over all things, where the fragrance of a thousand blossoms, not the soot of a thousand chimneys, is wafted in through open windows, and where grime does not blot out the heavenly face of nature. All these and other things tend to make this plague of smoke a more terrible thing to us artists than even to our non-artistic fellow-sufferers. Certain it is that no body of men would hail with greater joy the dawn of that day when this black will be at least assuaged. We are led to believe, from what Mr. Ernest Hart has said, that perhaps this much-desired solution is not so very far distant. It is to be hoped that the urgency of the need will furnish, if it has not already furnished, an incentive to inventive ingenuity and production, and that the day is not very remote when the problem of the abatement of smoke, without any of those ventilation difficulties which have been so amusingly alluded to by the American Minister, may be effectually solved. But when this happy day arrives there will still be a far more Herculean labour for the Smoke Abatement Committee. The remedy having been found, the patient must be taught to take it. It must be brought home to every man that he is not a victim only, but a begetter and spreader of this plague of smoke, which rises not only from his neighbour's chimney, but from his own also. When he is awakened to that sense of responsibility, when every householder shall say, "My chimney shall not smoke," then the millennium will have come. From that day forward the half-remembered sun will again shine in the forgotten blue sky, and the foul fuliginous days of the present will become a horrid dream and memory of a very dismal past.

**Sevington.**—A painted window has lately been erected in the parish church of Sevington, Kent. The window has the arms of Norwood and Price introduced, and has been executed by Mr. Charles Evans, of Warwick-street, Regent-street.

## EXTRACTION OF SEWER-GAS FROM HOUSES.

THOUGH a great advance has been made in the last few years in the protection of houses from the dangerous gases generated in the sewers and drains, and a generally approved system has been established by our sanitary engineers, there are, in my opinion, weak points in that system not sufficiently recognised.

The arrangement usually adopted is to cut off all communication between the house and the street sewer, by the whole drainage being made to flow for some small space in a channel quite open to the air, and thence through a trap into the sewer. The house system of pipes and drains being thus secured, as far as a water-seal can do it, against any influx of gas from the sewer, there is no danger to be dealt with, but the gas generated on the premises. To reduce the danger of this to a minimum, all the rain-water and waste from cisterns, sinks, baths, and the like, are made to flow into the open air, and so through traps into the house-drain, leaving no communication between the interior of the house and the drain but the unavoidable connexion of the w.c.s with the soil-pipe, which pipe is converted into a ventilator by being carried up, of its full size, well above the highest windows. By this arrangement there is a free passage for a current of air from the opening between the house and the street sewer and the head of the ventilator at the top of the house. When this is working well, an influx of air is secured at the lower opening, no gas can accumulate, and all that is generated will be greatly diluted, if not entirely chemically changed, before it reaches the w.c. valves, through which it has at times an entrance to the house. It will be seen that the success of this arrangement depends upon a constant current being established through the soil-pipe ventilator, on which depends, not only the dispersion of the gas, as above described, but the very important point of the lower opening being an inlet, and not an outlet for the gas of the drain; as its position below the windows and doors of the house make it essential that it should not act in the wrong direction. It is essential also that the current should be repaid, as on that depends the condition of the foul air when it reaches the w.-c. inlets. If the flow up the soil-pipe is sluggish, the air drawn from so foul a source may be full of gas. The first question, therefore, is whether in this arrangement any rapid and constant current has been secured; and it must be admitted, I think, that the answer will not be satisfactory.

When no mechanical appliance is added, the upward current is supposed to result from the height of the ventilating shaft, aided by the wind across its open end; but when anything like an active current is found, with the air at rest, it must result from some difference of temperature in a part of the pipe, as there is nothing else to cause it, and when the wind fails the other action ceases. Neither one cause nor the other can secure the brisk and unfailing draught of air required.

Many laudable efforts have been made to produce and maintain this all-important current by means of cowls, but one and all of them depend for their success upon the wind. A faint breeze, however, never can produce a rapid current, and when the air is still no cowl can ever raise the wind.

We have not, then, in the ordinary treatment of houses the security we look for in the action of the ventilator, and to my mind there is another fault in the arrangement capable of correction. I have always advocated the advisability of using a ventilating pipe, which, having no connexion with the interior of the house, may induce a current down the soil-pipe, getting its supply from the upper air, so that, if there is any influx in the w.c. when the valve is open, it will be from the best source available and not the worst.

Though this arrangement does not correct the absence of a current of air in the ventilation, it produces the effect required when the movement is ever so slow, as the foul air from the drain cannot reach the vulnerable points when there is any downward current at all. I may add that I do not stand alone in the advocacy of this system; others have used it, and all I want is to urge its adoption generally.

In a few words, the arrangement I criticise is, as I have said, a step in advance. The trap between the house and the sewer is most

important, and a free passage of air through the house system, by there being an opening at both ends of it, is as important. The gas cannot accumulate and concentrate, nor can a pressure from its expansion force it into the house as it does where no change has been made, while the connexions between the house and the drains are few instead of many. These are very great improvements, and have shown their value in numberless cases. The arrangement I advocate is another step forward, removing the necessity for the questionable opening on the ground-level, drawing the best air obtainable past the soil-pipe connexions with the house, and making the working of the system independent of a rapid current where it can not be secured,—up the soil-pipe. In the simplest houses, these are the most important improvements; and, in such buildings as necessitate openings on a low-level,—in confined courts,—they are of infinitely more importance still.

I have found one, and only one application of this system that satisfies me, and that is, in the admirably-appointed houses building in Philbeach-gardens, West Brompton, by Mr. Mineard, who not only draws his ventilation current down the soil-pipe, but ensures a constant draught by having a gas flame in his ventilator. In this arrangement the system is perfect, a strong indraught being found, not only at the head of the soil-pipe, but wherever a valve is opened, and the critical inlet between the house and the street sewer is unnecessary. This, of course, causes some expense; it may add 25*l.* to the cost of a house, and 2d. a day in gas. But there will doubtless be modifications of the system. Other sources of heat may be found, or one ventilation may serve for two houses. At its worst, as Mr. Mineard very justly says, the daily cost is only equal to that of one glass of beer.

F. C. COTTON, Major-General.

## THE WATER SUPPLY OF DUBLIN.

INSTITUTION OF CIVIL ENGINEERS OF IRELAND.

MR. PARKE NEVILLE, M. Inst. C.E., the President of this Institution, took for the subject of his inaugural address (delivered in Dublin) the Vartry Waterworks. We extract the following passages:—

The river Vartry, from which the city of Dublin, together with the extra municipal districts, are supplied, is a comparatively small mountain river in the county Wicklow, which rises on the southern base of the great Sugarloaf hill, and thence flowing in a nearly due south direction, passing through the Devil's Glen and the village of Ashford into the Broad Lough (where it assumes the name of the river Leitrim), and discharges into the sea at Wicklow.

The length of the river, from its rise to the sea, is 17¼ miles, and the total catchment area is 34,890 acres. The geological formation of the entire drainage area is the lower Silurian and Cambrian slate, unless where near the mountain tops the granite crops out in spots. It yields a peculiarly soft, pure, clear water during a considerable part of the year, but for some months the water collects peaty matter from nearly cut-out bogs through which its tributary streams pass down, and this renders the filtration of the water necessary. From the natural formation of the valley through which the Vartry passes, it was easy to find out the best site on which to place an embankment, to form a storage-reservoir for the water-supply of Dublin. Considerable difficulty arose in ascertaining the quantity of rainfall which could be relied on in the Vartry districts as no rain-gauges existed prior to some erected by the Corporation in 1860. Mr. Glaisher, of the Royal Observatory, Greenwich, was, with other scientific men, together with the consulting engineers of the Corporation (some of the most experienced gentlemen in waterworks in the world), were consulted, and finally, from observations and the best data obtainable they calculated that the average depth of rainfall in dry years would be 29·2 in., and after allowing 15 in. to be lost in evaporation and absorption, 14·3 in. would remain for the supply of Dublin during the succession of dry years. The catchment area, draining into the river above the point selected as the site for the erection of an embankment, was 14,080 acres, and 14·3 in. of rain over this area would be sufficient to give 12,000,000 gallons per day, or 25 gallons a head for an assumed population of 400,000,—2,000,000 gallons for ordinary manufacturing purposes. In estimating the above quantity as the probable rainfall, care was taken to arrive at the minimum annual rainfall, making allowance for the probability of a succession of dry years. In the plan as lodged in Parliament, it was designed to construct a compensation reservoir at a point lower down the river (at Annagollen Bridge), at about two miles below the proposed storage-reservoir, to provide water compensation against the claims of the millers and riparian proprietors on the river below, so that if the rainfall were taken it would give them more water than they were entitled to. However, fortunately, prior to going before the Committee on the Bill, this reservoir was abandoned, and it was determined to give money compensation in lieu. By this arrangement the Corporation have become the sole owners of all the water which falls upon the catchment-basin above their works, and no party has any right or title to use or divert any of it.

The point selected on the river Vartry as the site for the embankment to form the great storage reservoir is about 7½ miles from its source; the level of the water in the river at this point was 632·74 ft. above Ordnance datum, and about 520 ft. above the highest part of the city of Dublin. The level ground where the river rises is about 1,100 ft. above Ordnance, and the boundary of the catchment basin on the west varies from 2,384 ft. at the top of the Dance Mountain to 1,581 ft., and on the east from 1,200 ft. to 800 ft. The main embankment which forms Lough Vartry is 66 ft. high at its deepest part, and the greatest depth of water is 60 ft.; it is 1,640 ft. long and 28 ft. wide on the top, over which the public road passes; the base at the deepest part is 380 ft.; the inner slope being 3 to 1, the outer slope 2½ to 1; and the total quantity of earthwork in it is 320,000 cubic yards. The reservoir, when full, covers about 405 statute acres, and the top-water level 692·45 above Ordnance datum; the bye-wash, which is on the eastern end, is 300 ft. long; the mean depth of the reservoir is 22 ft., and its capacity is about 2,400,000,000 gallons, or equal to 200 days' supply for the city of Dublin and suburbs, at the rate of 12,000,000 gallons per day; but this allowance was, as I will hereafter show, very much too little. The reservoir and works are surrounded by a boundary-wall of rubble stone 5 ft. high. It is about 11¼ miles long, and encloses about 550 acres under lake embankment, filters, bye-wash, &c. The water is conveyed out of the lake on to the filter-beds, of which seven were constructed originally, and there were three added about three years ago. They are all the same size, 215 ft. long and 115 ft. wide at the top, and 187 ft. by 89 ft. at the bottom, and are 10 ft. deep from the level of the roads, and contain 6 ft. 6 in. in depth of filtering material. It was intended to work the filters with a head of 2 ft. of water, but this did not produce percolation sufficiently speedy to meet the demand; about 3 ft. is now maintained. The total area of land occupied by the filter-beds, tanks, water-courses, and ground, below the embankment, is over 50 acres.

It is necessary to clean the filters, according to the season of the year, by scraping off the top about half an inch of sand and a thin fibrous substance that deposits on the beds, and occasionally as it is required about 6 in. of the sand is dug off the entire of a bed and replaced with clean-washed sand, cleansed by a sand washing-machine erected at the filters, which is worked by a small turbine-wheel which derives its motive power by head of water brought down from the reservoir; also, when found necessary, all the sand, 2 ft. 6 in. in depth, is renewed with new or clean sand. The water is delivered into pure-water tanks, 250 ft. long at top and 150 ft. wide at bottom, and with a depth of 11 ft. of water checking all vegetation. The water is conveyed from the pure-water tanks by a pipe 150 yards long and 33 in. diameter, and 670 yards of 42-in. pipe to the tunnel, the fall being 45·5 ft. per mile. The tunnel which conveys the water under the range of hills dividing the Vartry Valley from the eastern side of the hills, is curved round in its course, as the water enters at the south end of the tunnel, and discharges at the north-east into a relief-tank at Callow-hill.

At the tank at Callow Hill a cast-iron gauge is fixed, of the most improved section, the same as designed by Mr. Bateman for the distributing reservoir of the Glasgow waterworks at Milngavie. By this gauge weir the quantity of water passed down from the storage reservoir daily for the supply of the city and suburban districts, and all manufacturing purposes. The water is gauged six times daily by a fixed index. The weir is divided into two bays of 10 ft. wide each, over which the water falls into a circular basin 86 ft. diameter and 10 ft. deep. The level at the tank is 602 ft. over the Ordnance datum. From this tank the water is carried to the Stillorgan distributing reservoir by a main 2 ft. 9 in. diameter, in length 17 miles 4 furlongs 42 yards, or 30,942 yards, with a falling line or hydraulic inclination of 20 ft. per mile. Of this main 21,048 yards are laid across the country, and 9,894 yards along the county roads. There are three relieving-tanks constructed along this line of pipes to break the pressure, and at each are inlet and outlet pipes to turn on or off the water. The main is made of different thicknesses, according to the pressure. In the Glen of the Downs the main is $1\frac{3}{16}$ in. thick, the pressure 300 ft. Also part of pipe-laying was difficult, especially at the crossing of the Dargle, Cookstown, and river at the county boundary, but chiefly at the first-named. The main was originally designed to pass under the river, but after the pipes had been laid alongside the river to some distance, and got under the bed of it, a great flood came down and tore up part of them, and altered the bed of the river. I then recommended that the main should be carried over the river, which was adopted, and the handsome bridge supporting the main now adds to the beauty of the Dargle Valley.

From Rathmichael tank the water flows to the Stillorgan reservoir; but from having to change the site of those reservoirs, owing to the enormous price attempted to be obtained by the owner of the land on which they were first fixed by Parliament, the land on which they now stand was purchased, and by this led to the distance of the reservoir from Rathmichael being increased and the hydraulic inclination somewhat reduced. There are two reservoirs constructed,—the level of the lower being 271 ft. above Ordnance datum; average depth, 22 ft.; contents, when full, 43,166,540 gallons: the level of the higher is 274 ft. above Ordnance datum; average depth, 20 ft.; and contents, when full, 43,057,424 gallons. The grounds within boundary walls is 26a. 0r. 30p. There was considerable difficulty in getting good foundations for the puddle-gutters in the banks of those reservoirs, from meeting some very bad faults in the soft granite rock; but since all was finished, there has not been any trouble since or sign of leakage. There is a handsome valve-house and screen-chamber built at the lower reservoir valves, through which the water is drawn for the supply of the city from one or both reservoirs, it first being passed through a copper screen, thirty strands to the inch, to catch any floating matter, &c. The screw-gearing for working of the valves is placed on the floor of the valve-chamber round the walls, with indexes on them, so as to enable them to be worked with the greatest accuracy.

In the year 1874 a separate main, 15 in. in diameter, to give a supply to Kingstown and Dalkey, was laid, provision having been made originally in the walls for this extra main. For the supply of the city two mains of 27 in. diameter are laid along the Donnybrook-road to the city boundary at Eustace Bridge; along their course small valve chambers are built at Merrion-avenue, Simmonscourt, and at South side of Leeson-street Bridge. In those are groups of valves, by working which the water can be turned off in case of accident from one of the mains to the other, and the supply kept up by the second, while repairs are made to the first. At those points, as well as others, valves are placed and branches taken off for the supply of the Pembroke and Blackrock townships, and on the north side of Leeson-street there is a group of valves for controlling the admission of water into the city main, and here there is a safety station and telegraph, where men are kept night and day. From or to this station messages can be sent at all hours, both night and day, as to the state of the water passing over Callow Hill weir, and the minutest matter that may occur along the line of main. Men also are engaged to walk the entire line once every twelve hours, to watch for leakages, &c., on the discovery of which they are immediately communicated with the nearest telegraph station. Subsequently, under private Acts of Parliament, the following townships entered into contracts for supplies of water:—Clontarf, Kilmainham, Killiney and Ballybrack, Bray, Kingstown, Dalkey. Of course some new works were required, and various alterations of small matters found necessary to complete the line, and put the system, after connexions with the

townships, into effective working order. The first real want found was a greater filtering area, as at certain periods of the year a good deal of peaty matter came down, and required that filter beds should be frequently cleaned, and occasionally we had to send down in very dry weather small quantities of unfiltered water to keep up the supply to the high levels. In 1874 an Act of Parliament was obtained for obtaining additional land for the new filters, &c. Three new filters were commenced in 1876 in continuation of the four original, made on the south-east side, pure-water tanks. They were made each the same areas, and in other respects the similar to those made with the works. By the Act we got a splendid fine-sand quarry at Annamoe, where we have an inexhaustible supply of perfectly clean sand always at hand. From the natural configuration of the ground north-east of the filters the embankments had to be very high, and the puddle-trench in the valley next the bye-wash sink very deep; the height from the bottom of the puddle-trench to the top of the road round the filter at the north-east corner was 40 ft. deep. The tail of the bye-wash had to be entirely altered, and the channel lengthened by 350 yards to reach the old river-bed. The conduit to convey the filtered water back to pure-water tanks was designed at first to be an iron pipe, 40 in. in diameter; subsequently I decided to construct it of Portland cement concrete, 4 ft. 6 in. by 4 ft. diameter. This was placed on the top of the northern puddle-gutter; the puddle was carried up round it, and this has proved very successful, not showing the least subsidence, and was a great saving on using an iron conduit. The entire of these works have been most successfully completed by men employed direct, under the supervision and direction of the Corporation engineers and overseers, and not the slightest sign of leak or settlement of any kind has occurred. The cost has been about 9,184*l.*, and we have now, by continuing the northern water-carrier to the river, been able to get rid of a dead end which we had on this carrier formerly, so that both the carriers can now be flushed and swept out as required. This work was finished in October, 1878.

Since the construction of those new filters, making ten in all, we have been able to filter the water slower, and deliver it always filtered in a better condition to the consumers in the city and townships.

Great complaints are made from the townships and part of the city from want of pressure on the mains. This is principally due to waste of the householders, chiefly from their not looking after their fittings and allowing the water-taps to run to waste; but there are parts of Dalkey and Killiney where the want of pressure is due to the present level in the Stillorgan reservoir and the low levels drawing away the water.

Immediately after the Vartry was decided on by Mr. (now Sir John) Hawkshaw in his report of October, 1860, as the best source for the supply of water to Dublin, the Corporation adopted it, and in 1860 several rain-gauges were placed at different points adjoining the proposed reservoir and works.

The quantity of water that can be relied on from the catchment is 7,986,000,000 gallons, and if from this is deducted the quantity assumed to be drawn out in one year by the 33-in. main,—5,840,000,000 gallons,—the quantity remaining from catchment that the pipe, at 16,000,030 per diem, cannot bring down is 2,146,000,000 gallons. Or, if I assume the 33-in. pipe capable of discharging 18,000,000 gallons per diem, this would convey into the city 6,570,000,000 gallons, and if this be taken from 7,986,000,000 gallons it would leave 1,416,000,000 gallons of water due to catchment beyond what 33-in. main could take. I will take, for safety, that 2,146,000,000 gallons of water remain, coming off the catchment, which the 33-in. main cannot take, and which go to waste over the bye-wash, and to impound so as to utilise this, a second reservoir will have to be constructed. There is a good site for an additional reservoir about a mile to the north of the present Vartry Lake, where a new one could be constructed which would hold about 1,000,000,000 gallons, and this, I think, would be large enough.

The real cost of bringing into Dublin the remainder of the water that can be got from the catchment belonging to the Corporation would be about 55,000*l.*, and for this they will secure, say, 2,000,000,000 gallons, at least in the driest of years, beyond the present supply, or about ,479,000 per diem.

Certain experiments made by the author (and the details of which he gives) as to the discharge of water through large mains or pipes, show the necessity, in his opinion, of correcting the ordinary formulæ of Du Buat, Eytelwein, Leslie, and others, "on which engineers so much, or I may say, entirely, rely for calculating the flow of water under heavy pressure in pipes of large size; and the main object I have in bringing this very important question forward is in the hope that some of the young members of the Institute, with time to spare for a little scientific pursuit, would take the matter up and work out a formula or table on the subject, and every facility the Dublin works afford I will place at their command. In the present state of things it cannot but be regretted that, in using Beardman's tables, or the formulæ referred to there, engineers are led astray as to the real facts."

## PUBLIC-HOUSE PROPERTY.

A REMARKABLE illustration of the value of public-house property is to be obtained by the application of a little study to the list of public-house sales for a year (viz., from November, 1880, to October, 1881, both inclusive), which is to be found in the *Licensed Victuallers' Guardian*. Ten densely-printed pages tend rather to confuse than to enlighten the hasty reader. But study of the same brings us to the conclusion that 699 public-houses, in London and the vicinity, were brought to the hammer in the year in question, out of which only 154, or 22 per cent., were sold, the remainder being bought in, withdrawn, or otherwise not sold. The value in some cases was very high. The Chippenham Tavern, Harrow-road (a 70 years' lease, at the rent of 150*l.* per annum), sold for 17,500*l.* Upwards of 10,000*l.* was given for each of the following:—The City Arms, City-road; the Falcon, Clapham Junction; the Greyhound, Fulham; the Kingsbridge Arms, Millwall; the Plough, Clapham Common (13,000*l.* for a 35 years' lease at 134*l.*); the Russell Arms, Gravesend; and the St. Helena Tavern, Rotherhithe. The Hop Pole, Hammersmith, was bought in for 16,000*l.*; the Skinners' Arms, Great Suffolk-street, Borough, at 18,000*l.*; and the Woodbury Hotel, Stamford-hill, for 16,500*l.* In eighteen cases only is "no bid" stated. The lowest price fetched was for the Fox and Hounds, Southwark Bridge-road, which is at a rent of 60*l.* per annum, but no lease is mentioned; for this the sum of 170*l.* was paid. But few purchases, however, come below four figures; and sums of from 3,000*l.* to 5,000*l.* seem to be the prices in the majority of cases. In regarding the extraordinary impulse which has lately been given to the trade of the builder in certain districts,—as, for example, in the neighbourhood of Wandsworth Common,—we cannot but think that a study of the above-cited list may be of material service to the hesitating investor.

## DOUBLING THE SOUTH-WESTERN RAILWAY FROM CLAPHAM JUNCTION TO WIMBLEDON.

LARGE numbers of workmen are at present employed on the London and South-Western Railway, between Clapham Junction and Wimbledon, in carrying out the works for laying down another double line of rails between the points named, in order to give increased facilities for carrying on the present congested traffic, and also to provide railway accommodation for the numerous population around Garratt-lane, which is situated about midway between Wimbledon and Clapham Junction. At present none of the company's trains stop between the Junction and Wimbledon, the consequence being that the residents in Garratt who may wish to avail themselves of railway communication have to walk a distance of about two miles, to Clapham Junction on the one hand, or to Wimbledon on the other. This inconvenience to the inhabitants of the increasing village of Garratt will shortly be removed by the completion of the works now in progress for doubling the line, and the opening of the new station which is about to be erected on the west side of the railway in Garratt-lane. From a short distance south of Clapham Junction to Wandsworth Prison, the line is in cutting, and thence runs on an embankment to within about two miles from Wimbledon, when it again proceeds through a cutting. The embankment portion is being widened on the east side, whilst in the cutting portion excavations are proceeding on both sides of the railway, so as to admit of an additional line being laid down on each side. It is expected that the works will be completed and the widened line opened for traffic in July next. Meantime, in anticipation of the opening of the station, a considerable amount of building is going forward in the neighbourhood of Garratt-lane.

## NEW YORK AND ITS WATER SUPPLY.

ONE of the "multitudinous problems in the Government of the metropolis." This is one of the headings with which the *New York Herald* introduces an elaborate report of Commissioner Hubert Thompson on a plan for increasing the Croton supply of water for the use of that city; and some of the facts in it bear on the question of water supply and works to an extent that makes the report of great interest. The year 1881 was a year of deficient rainfall in the United States,—it was 2 in. less than in any previous year since the introduction of the well-known Croton water as a source of supply for the city of New York, whilst the frost at the beginning of the year increased the quantity of water used there as here. Mr. Thompson, in these circumstances, requested the chief engineer of the Croton Aqueduct, Mr. Isaac Newton, to consider the question of the water supply, and to report on the steps needed for its maintenance and improvement. After several other suggestions, Mr. Newton brought forward a plan for the storing and conveying the water of the Croton to the city. That plan is to construct a dam across the Croton near its mouth, and thus to embrace the entire area of its water-shed, and to add 23 square miles to the existing drainage area. There would be formed a reservoir or lake of over 3,600 acres, which would give storage for 32 million gallons, without considering the flow of the Croton. From this reservoir an aqueduct, mainly in rock tunnel, would be run to the Haarlem River, and thence to the existing Central Park Reservoir. The estimated cost was at first 2,400,000*l.*; but changes in the quantity proposed to be provided for brought up that amount to 2,800,000*l.* This, then, in brief, is the great scheme that New York has before it for the extension of its water supply.

As expedients for the checking of the waste of water, the use of meters was recommended, and the report goes on to say that in New York there are now 5,293 such consumers' meters fixed in hotels, breweries, offices, &c., the quantity of water passing through which is now 11,925,400 gallons daily. But it is added that if meters were used in the same proportion to population that they are in some other American towns there would be, instead of 5,293, not less than 400,000.

A few facts are recorded showing the manner in which the existing supply of water in New York continues to be extended in its use. Over nine miles of pipes additional were laid, during the past year, making 512 miles of distributing pipes, with 5,427 stop-cocks. It is proposed speedily to place new throttle-valves on the large outlet mains at the distributing-reservoir, so as to minimise the loss of time in cases of fire in the turning on of an increased pressure. The fact most dwelt upon in the report, so far as the existing supply is concerned, is the need for the increased use of water-meters or some similar instrument, so as to check the enormous waste that is known to exist, more especially in dwellings now exempt from the law enforcing the use of meters.

## AN EXTRAORDINARY SPRING.

IN a mine near the busy centre of St. Etienne, a French mining engineer, in boring at a depth of 1,500 ft., is reported to have come upon a hot spring, whose waters rushed forth in a column to a height of nearly 80 ft. above the surface of the earth. It is similar in height and heat to the so-called Stracke geyser, and is strongly impregnated with carbonic acid. The French Academy of Sciences have determined to send a deputation to examine minutely into the peculiarities of this phenomenon.

**Wood Paving, Kensington.**—For the Kensington Vestry the Improved Wood Paving Company, Limited, are now putting down about 30,000 square yards of paving, at the cost of 14,760*l.*, in the Brompton-road and Richmond-road, running up to the "Bell and Horns."

## THE BUILDING EXHIBITION AT THE AGRICULTURAL HALL.*

### VI.—DECORATIVE ART AND MATERIALS.

*Wall, Ceiling, and Floor Decorations.*—Some excellent paper-hangings, very good in design and colour, are shown by Messrs. W. Woollams & Co., of High-street, near Manchester-square (Stand 58A). These papers possess the great additional merit of being entirely free from arsenic, although some good bright green colours are among those shown in the specimens. Messrs. C. Hindley & Sons, of Oxford-street (Stand 56), display some excellent embossed "Japanese leather papers," admirable in effect. With the appearance of old embossed leather, their cost is little above that of a good ordinary wall-paper. They are made, not only in the ordinary width, but 1 yard wide, and well deserve attention. The Papyrotile Company (Stand 59A) again exhibit their handsome and convenient wall decoration. It is warm and comfortable, and easily applied. Highly satisfactory results are attainable with it at a comparatively small cost. The "Linerusta-Walton," or Sunbury wall decoration, is exhibited at Stand 29, by the manufacturers, Messrs. Frederick Walton & Co. (Limited). We have on several previous occasions noticed its merits. It is impermeable to moisture, readily washable, and applicable to an infinity of uses besides its chief use, that of providing a permanant ornamental covering for walls. It readily lends itself to any style of design, and the relief of surface obtainable by it is of great artistic value. The designs exhibited are mostly in the prevailing mode. Messrs. Bellman & Ivey, of Wigmore-street (Stand 74), have again a very excellent display of scagliola, including an architrave and "over-door," and a dado and pilaster, made for the new building of the Life Association of Scotland, Pall-mall, from the designs of Mr. Alexander Peebles, architect. The Papier Mâché Co., Wellington-street, Strand (Stand 84) show some very well modelled architectural enrichments in *papier mâché* and *carton-pierre* for ceilings and walls. Such details as capitals, consoles, &c., are also exhibited here. Messrs. George Jackson & Sons, of Rathbone-place (Stand 58), are exhibitors of some excellent ceiling and cornice enrichments in fibrous plaster. Messrs. Whitcombe & Emson are exhibitors of Hitchins's patent plastering, which we have described on previous occasions. It has much to recommend it.

*Paints, &c.*—The Albissima Paint Company (Stand 57) exhibit their excellent white paint, which is non-poisonous and, we believe, durable in wear. It is, we hear, coming into increasing favour. The Sanitary Paint Company, Liverpool (Stand 33), exhibit specimens of work executed in their non-poisonous manufactures, including "Griffiths's patent white," enamel paints, silicate washable distemper, and a petrifying liquid for damp walls. The results are satisfactory. The Silicate Zopissa Paint Company (Stand 91) exhibit their Silicate Zopissa composition as applied to bricks, stone, plaster, and other materials. This company's Granitic Paint is a very useful preparation. Mr. H. C. Stephens, of Aldersgate-street (Stand 91A), shows his wood stains and specimens of excellent work done by their aid. Messrs. Wilson & Co., of Stowmarket (Stand 22A), exhibit their useful alkaline composition for removing and cleaning paint.

### VII.—MISCELLANEOUS.

*Locks and Ironmongery.*—Messrs. Hobbs, Hart, & Co., Cheapside, E.C. (Bay 5), have on view some very fine specimens of their fire-resisting safes, specially designed for banks, merchants, and other firms. The cabinet-safes, with imitation drawer-fronts, are highly finished. Here are also on view strong-room doors designed for brick and iron bonded walls and bullion vaults. There is a good assortment of locks, keys, and door and bell furniture to match. Among the exhibits are "Change Key-locks." The exhibits may be safely pronounced excellent in workmanship. Messrs. Pryke & Palmer, Upper Thames-street, E.C. (Stand 77), exhibit a good and varied assortment in wooden lock-furniture in addition to their other various objects. The locks include plain brass rim and mortise, with furniture and finger-plates to match, together with hand-painted, gilt and plain china lock-furniture. The firm also exhibit a fanlight opening appliance very serviceable under particular circumstances. Mr. James Hill, Upper Thames-street, E.C. (Stand 30), has on view this year a very large display of locks, and lock, door, and sash fasteners and fittings, together with general building ironmongery ware. A speciality on view this year is "Hill's New Patent Spindle," with knob adjustment and covered rose. This is worthy of attention, and it certainly has obvious advantages over the old methods of fastening the knob to the spindle with the exposed screw,—sure to work out after being some time in use. This knob adjustment is suitable to either thin or thick doors, and is also applicable to both rim and mortise locks. Messrs. Joseph Kaye & Co., High Holborn and Leeds (Bay 6), show what are termed "Indestructible Locks" and door furniture. A piece of octagon-shaped timber framing is shown on this stand, in every square of which a door is hung, affording different examples of the locks and furniture used. The locks include mortise, rim, ship locks, catches, school locks, and other varieties. The Yale Lock Manufacturing Company, Stamford, Conn., U.S.A., and Strand, W.C. (Stand 94), are strong in their display of locks of every description,—automatic time locks, and door, drawer, and chest locks, &c. Mr. William P. Bonwick, Coningham-road, Shepherd's-bush (Stand in South Gallery), shows Crispin's Patent Springless Door Lock, and his own patent self-locking window and sash fasteners. Messrs. Walker & Worsey, Birmingham (Stand 120), exhibit compound double-action rim and mortise locks, and a great variety of other locks, sash-fasteners, iron safes, and general brasswork. In the compound double-action locks, the doors can be opened by turning the knob either way, pressing upwards or downwards. Iron safes and general brasswork are also on view. Chatwood's Patent Safe and Lock Company, Cannon-street, E.C. (Stand 61), present a selection of their "Invincible" and four lever hand-made locks, and their patent fire and thief resisting safes. Messrs. Nettlefold & Sons, High Holborn (Stand 35), have a general display of lever and guardian locks, spindled lock furniture, sash fasteners, with a fine assortment of cabinet brass foundery and builders' ironmongery. The exhibits, as a whole, are good and attractive. Messrs. Frederick Whitfield & Co., Oxford-street, Birmingham (Bay 10), exhibit wrought-iron doors and frames for bankers' vaults, office fire-proof rooms, for large warehouses, &c. The specimens are commendable. The exhibitors also show their patent screw-bolt and other safes.

*Kitcheners and Ranges.*—Messrs. Steven Bros. & Co. (Stand 45), make one of the best displays in this department. Especial mention may be made of their "Leamington" kitcheners, but they show a variety of other ranges. Messrs. Ashton & Green (Stand 69) have a representative display of these goods, including Dow's patent close and open fire-range. Leamington and other ranges are shown at this stand, including a very compact one which is christened the "Master" range. It is self-contained and requires no brickwork. House-owners and builders should look at it. Mr. W. Addis, of Leicester-square (Stand 28), has, as usual, a good show of kitcheners and ranges. Among them we may mention a fine Leamington range, with grill, "Addis's Improved Open and Close Kitchener," Badger's patent "lifting-fire kitchener," and Cundy's patent "Economic" cottagers' kitchener, which is very compact and convenient, affording a large oven. Mr. William Stobbs exhibits Janes & Kirtland's "Beebe" range (an American invention), which burns either anthracite, coke, or common coal. The "Kaio-Kapnos" range, exhibited by Messrs. Clark, Bunnett, & Co., is devised on the same principle as the "Kaio-Kapnos" stove, elsewhere mentioned. Messrs. F. W. Reynolds & Co. (Bay 4) show some good serviceable ranges and kitcheners. Messrs. Newton, Chambers, & Co., of Thorncliffe Iron Works, Sheffield, exhibit a large "Yorkshire" range, with four ovens, and one of their more generally serviceable "Thorncliffe" ranges. This firm enjoys great repute for goods of this kind.

*Chimneypieces.*—Messrs. Ashton & Green (Stand 69) have a most attractive show of very fine chimneypieces, particularly noticeable among them being the one in pure statuary marble, which has a sculptured figure in front of each pilaster. In the same row are some other remarkably good chimneypieces in Belgian, Italian, and other marbles. The same firm are also exhibitors of enamelled slate chimneypieces (one of the specialities of their manufacture) and of chimneypieces in wood. Mr. Walker, of Bunhill-row, exhibits, in conjunction with the grates and fenders of Messrs. Steel & Garland (Stand 64), a number of very good chimneypieces in walnut wood. Messrs. F. W. Reynolds & Co. (Bay 4) have a good display of English and foreign marble chimneypieces. The Coalbrookdale Company (Stand 38) are exhibitors of delicately-finished cast-iron mantelpieces and overmantels in the Adam and other styles. They are remarkable for excellence of workmanship. Mr. W. H. Lascelles (Stand 153) shows some very good and cheap mantelpieces in red and other concrete, designed in the mode just now fashionable. Mr. Tagnon, of Gray's-inn-road (Stand 109B), makes a good display of marble chimneypieces.

*Methods of Glazing, &c.*—Messrs. W. E. Rendle & Co., of Westminster, show their patent "Acme" system of glazing, which has been and is being largely used, and with great satisfaction to the users. It has been adopted by the Government for dockyard and other buildings, and also by railway companies. Within the glass house which is erected in illustration of this system Messrs. Rendle Brothers exhibit their almost magical "Electric" paint-remover, favourably noticed by us in some detail at the end of our last volume. Visitors should certainly witness the tests that will be made of it during the exhibition. In the Gallery (Stand No. 9), Mr. T. W. Helliwell, of Brighouse, shows his patent "Perfection" system of glass roofing without the use of putty. It is a very good system, its characteristics being strength and simplicity. Equally deserving of note is the same exhibitor's patent method of roof covering in zinc, lead, copper, or corrugated iron. By this system no rivet or bolt-holes are required in any of the sheets of metal, and no ridge-rolls are required. A roof covering made on this principle can be very quickly put together, and is very light. Another very good system of glazing without putty is that shown by Mr. C. Causley, of Shacklewell (Bay No. 13). It combines strength with elasticity and lightness, is perfectly water-tight, carries off all water of condensation, and allows for expansion and contraction. The horticultural building which is erected as an illustration of the employment of the system (which is, however, applicable to skylights of all kinds) is provided with a lifting ridge which can by means of simple mechanism be at once raised vertically for ventilation, while at the same time entirely excluding rain. Other systems of glazing are exhibited by Messrs. W. Lawrance & Son, of Stevenage, and Messrs. Tracey & Son, of Ilford.

*Shutters and Blinds.*—Messrs. Hodkinson & Clark, Canada Works, Birmingham (Stand 46), exhibit variously affixed revolving shutters and blinds. Their stand in the hall is a large and attractive one, being in itself a house or office in which their systems of shutters and blinds are embodied in the construction. The speciality of the firm for this year is a model of revolving shutters, partitions for the division of schools, or other rooms into compartments when required. They also exhibit a specimen of their fireproof theatre screen or curtain, in iron, which would completely shut off the rest of the building from the stage. This fireproof screen can be made to any ordinary size without vertical divisions, or up to a width embracing 48 ft. In fact, this screen is an iron curtain, on the revolving principle. Messrs. Clark, Bunnett, & Co., Rathbone-place, Oxford-street (Stand 34A), exhibit their widely-known patent self-coiling shutters, and various castings in bronze and iron. Mr. J. Stones, Ulverstone, Lancashire (Stand 24B), exhibits his revolving shutters worked by patent balance-weight motion, improved spring motion, or winding-gear; also his draught-excluder. The specialities put forward in the present exhibition are the "Patent Revolving School Divisions," worked by balance-weight motion.

*Electric Bells* are shown at Stand 107, in all their varied applications, by Messrs. Young & Buss. Their exhibits include an electric letter-plate and bell, and a simple system of electric burglar alarms, intended to give immediate warning of the opening of a door or window. The system is instantaneously put into or out of gear by the movement of a switch. These exhibits are very well worthy of the attention of visitors. One advantage of Messrs. Young & Buss's system of electric house-bells is that a pendulum signal is used, saving the trouble of replacement.

* Continued from page 340, *ante*.

*Gas-fittings.*—Messrs. D. Hulett & Co. have a very good display of gas-fittings, including the Siemens regenerative gas-lamp, which, we observe, is being tried (and with good results,—at any rate, so far as lighting-power is concerned) by the City authorities in that part of Holborn between the Viaduct and Holborn-bars. Mr. H. Condlly, of Hampstead-road (Stand 47), is also a prominent exhibitor of gas-chandeliers and lamps, and a very good show he has. Messrs. Wells & Co., of Shoreditch, are among other exhibitors of this class of goods.

*Gas-stoves* are shown in great variety by Messrs. Deane & Co., of London Bridge, the London agents of Mr. Thomas Fletcher, of Warrington, who has given great attention to the subject, and with remarkably good results. Not the least interesting of these exhibits are the several portable appliances showing the application of gas to various industrial purposes. Messrs. Hulett & Co., of Holborn, are also exhibitors in this department, and show some good cooking and heating stoves.

*Lifts.*—Messrs. Clark, Bunnett, & Co. (Stand 34A), show a very good safety-lift, which is self-stopping, both at the top and bottom of the shaft. It is very easily controlled. Messrs. Waygood & Co. (Bay 14), are also exhibitors of self-sustaining safety-lifts, as well as very convenient dinner-lifts.

*Ornamental Zinc-work* is shown by Messrs. R. W. Hale & Co., of Chalton-street (Stand 7), who have some very good dormers and finials. In the same class of work Messrs. Treggon & Co. (Stand 60) show, as on previous occasions, a high degree of excellence in workmanship.

*Pavement Lights.*—Hayward's patent semi-prismatic reflecting lens pavement lights, together with floor-lights, coal-plates, &c., are shown by Messrs. Hayward Bros. & Eckstein, of Union-street, Borough. That they are highly appreciated is shown by the large extent to which they are used, and they should be more so.

*Builders' Tip-up Carts* are shown by (among other exhibitors) the Bristol Wagon-works Company, whose exhibits include one of Margetson & Hek's patent cart for contractors and builders, which has many good qualities to recommend it.

*Gas Engines* are well represented by the "Otto," exhibited by Messrs. Crossley Brothers (Bay 14A); this is an established favourite. A new aspirant for favour in this direction is shown by Messrs Lewis & Lewis, of Cambridge Heath-road, in Bay 18 The Turner Gas Engines, shown by the Turner Gas Engine Company, St. Alban's (Stand 129), appear to possess some good points. The "Ord" gas engine is shown at Stand 149, by Messrs. Henry Wurr & Co. It deserves attention.

The Asphaltic Wood Pavement Company exhibit, at Stand 119A, specimens of the materials used, and models and sections of roadways paved by them. This company's system of wood paving is undoubtedly one of the best of the many systems which have of late years been tried. It is certainly far superior in most respects to some systems which have been put forward.

Exigencies of time and space compel us to postpone mentioning, until next week, several other exhibits,—notwithstanding the number of columns we have already devoted to the subject.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the Ninth Ordinary Meeting of the Session, held on Monday evening, the 20th of March, Horace Jones, Vice-President, in the chair,

The Secretary announced the decease of the following member:—Archibald Sample Anderson, Associate, 3, Great James-street, Bedford-row, W.C.

The Secretary read a letter from the Right Hon. Sir Henry Ponsonby, signifying the Queen's approval of the award of the Royal Gold Medal, 1882, to Baron von Feratel, Hon. and Corr. Member, and conveying Her Majesty's thanks for a Congratulatory Vote passed at the last meeting.

The portrait of John Whichcord, F.S.A., Past President, painted by L. Alma Tadema, R.A., Hon. Associate, and exhibited for the first time to the members, was formally presented by Charles Barry, F.S.A., Treasurer of the Portrait Fund.

Mr. C. Barry said,—I think, sir, that though we have to thank Mr. Whichcord for having consented to sit for his portrait, and to give to us and our successors the gratification of possessing it for all time, our thanks are infinitely more due Mr. Alma Tadema, who sits beside me here, for having undertaken a work in which we all feel so great an interest. I had the hardihood to ask a man like Mr. Alma Tadema to undertake this work, though I knew his position and the extreme value of his time, which, of course, no subscription such as we are able to raise can possibly compensate; and, therefore, I hope that the members will thank him in the warmest way for having undertaken the work which I so daringly asked him to do. You will notice that the treatment has an originality which is all his own. Instead of simply painting our Past President as a lay figure with an indefinite distance he immediately realised the idea which we wished to perpetuate, that he was a president. He therefore thought—and, I think, happily thought—that an individuality should be given to the portrait, that it should be the President of the Institute, seated in the President's chair, and wearing the President's insignia. The result is that we not only have from Tadema's pencil a portrait of an honoured president, but I venture to say,—I dare say the painter may blush, I do not know whether he is given to blushing,—but I venture to say, even at the risk of his blushing, that we possess a work of art far superior to anything that we have hitherto possessed of the kind. Now, Mr. Vice-President, as the treasurer of the fund, I may be permitted to remark that, out of 1,000 professional members, just 102 have at present the pleasure of presenting this portrait to the Institute. I need hardly say that from 102 architects no kind of compensatory sum could be raised,—although many of the subscriptions are very generous,—no kind of sum could be raised which could be of any adequate recompense to our friend Mr. Tadema. But I should like to add, sir, in conclusion, that I do not propose, as treasurer of the Whichcord Portrait Fund, to close the account for about a fortnight's time, and I should like that fact to be known to the other 900 professional members, for there must be many amongst them who will not allow their names to be absent from the list of subscriptions.

The Chairman.—It affords me great pleasure on behalf of the Institute to accept the noble and handsome gift which Mr. Barry has just presented. If our friend and Honorary Associate, Tadema, has found a good subject in our Past President to paint, our Past President has had an excellent artist to paint him.

The thanks of the Institute were then voted by acclamation and with loud cheers.

L. Alma Tadema, R.A., Hon. Associate.—Mr. Chairman, gentlemen, I rise to thank you for the kind way in which you have received my small efforts to show interest in this noble Society, to which I am proud to belong. You know that I have a special inclination to love architecture. I have shown it to you often in my works, and that is really the sincerest way of showing what one loves. Therefore I was really gratified when Mr. Barry thought of me in reference to the portrait of Mr. Whichcord. I have besides learnt, on more than one occasion, to appreciate that kind man whom I have had the happiness to paint for you. He has grown upon me since he came to sit to me, and become quite a friend. So I have to thank you for having given me the opportunity of counting one friend the more. Moreover, a painter tries to make a picture, but what he looks for, above all, is a little appreciation of his efforts, and that I have found so abundantly here, gentlemen, that I really feel inclined to do what Mr. Barry said I was going to do—to blush.

Thirteen Fellows and thirty-eight Associates were duly elected by ballot during the evening.

*Public Architectural Competitions.* — The Chairman reminded the meeting that an amended paper, entitled "Suggestions for the Conduct of Architectural Competitions," had been for some considerable time in the hands of members; that a statement of the whole course of procedure which had taken place in connection with the discussion of the matter of competitions had been published in a recent number of the Journal of "Proceedings"; and that a further amendment, proposed by the Institute Special Competitions Committee, of the "Suggestions, &c.," was printed in the last number of the "Proceedings." A discussion took place, and it was ultimately decided that a special meeting should be called to continue it.

## BUILDING PATENTS.*

### APPLICATIONS FOR LETTERS PATENT.

1,019. C. J. Mountford, Birmingham. Fire-resisting bricks and blocks. March 3, 1882.

1,021. L. Lenzberg, London. Door-rods and door-springs. March 3, 1882.

1,039. G. Gore, Balsall Heath, and W. Morris, Blackheath. Feeding domestic stoves and other grates. March 3, 1882.

1,047. L. A. Clark, Croydon. Fastenings for window-sashes. March 4, 1882.

1,065. J. Wetherilt, London. Blinds or screens for windows. March 6, 1882.

1,077. J. J. Lisle, London. Fire-blowers. March 6, 1882.

1,109. T. W. Helliwell, Brighouse. Securing to roofs, &c., of buildings, sheets of metal. March 7, 1882.

1,113. R. Pearson, Hull. Combination stench-traps. March 8, 1882.

1,128. J. Rawson, Balsall Heath. Apparatus for controlling the flow of water from water-closet cisterns. March 8, 1882.

1,143. E. P. Phillips, London. Spring hinges. March 9, 1882.

### NOTICES TO PROCEED

have been given by the following applicants on the dates named.

*March* 7, 1882.

4,848. H. Gibbons and A. Anthony, Hungerford. Locks and latches. Nov. 5, 1881.

5,018. W. T. Sugg, Westminster. Gas cooking apparatus. Nov. 16, 1881.

5,172. C. Piesser, Berlin. Water-closets. (Com. by R. Henneberg and A. Herzberg, Berlin.) Nov. 26, 1881.

5,391. W. R. Lake, London. Cesspools. (Com. by L. Mouras, Vesoul, France.) Dec. 9, 1881.

781. A. Ashwell, Dulwich. Indicating door fastenings. Feb. 17, 1882.

*March* 10, 1882.

4,902. J. F. Smith, Leicester. Construction of bridges, viaducts, &c. Nov. 9, 1882.

4,937. F. R. Baker, Birmingham. Spring hinges, &c. Nov. 10, 1882.

### ABRIDGMENTS OF SPECIFICATIONS

*Published during the Week ending March* 11, 1882.

3,292. A. Sclanders, London. Door fastenings.

Spring bolts are fitted to the top and bottom of the door, which pass into metal sockets in the door-frame. The spring keeps the bolts in the sockets while the door is shut. To open the same, the bolts are connected by cords or chains to two wheels, which are geared into each other. On depressing the lever of one of these wheels, both bolts are simultaneously withdrawn, and the door is released. (Com. by J. P. Black, Nelson, New Zealand.) July 27, 1881. Price 6d.

3,339. L. Bensel, Iserlohn, Germany. Locks and bolts.

The sliding bolt is so arranged in combination with a lock-spring that when the bolt is in the closed position a projection on it enters a hole in the spring, and is locked thereby. To release the bolt the spring has to be depressed. (*Pro. Pro.*) August 2, 1881. Price 2d.

3,351. E. J. Hill, Westminster. Hanging or supporting window-sashes, &c.

A rod is attached to the window-frame vertically, and on the sash is a piece of metal having on one end a hole large enough to work easily over the rod while it is in a horizontal position, but when it is moved out of this the hole grips the rod, and prevents the sash from being moved. (*Pro. Pro.*) August 2, 1881. Price 2d.

3,354. A. B. Carpenter, London. Sash or window fastenings, &c.

The lever is locked by a spring lever, which rises after the locking lever is turned to fasten the sashes, and prevents its being withdrawn. A stud is arranged to press the spring lever down when it is required to open the sashes. (*Pro. Pro.*) August 3, 1881. Price 2d.

## BAYLAN, GLAMORGANSHIRE.

THE new church here, which has been built entirely at the expense of Mr. G. Llewellyn, of Baylan Hall, from the plans of Mr. John Prichard, the diocesan architect, was consecrated last week. The style is Geometric; it is cruciform on plan, with central tower and spire. The nave and chancel are of equal height. The walls are built in thin courses in contrast with thicker ones; the dressings are in red sandstone, promiscuously interspersed with green, both from the Forest of Dean. The tower and spire are of wrought ashlar of the same stone; the tower above the roof takes an octagonal form, the angles being filled with pinnacles. The

* Compiled by Hart & Co., patent agents, 28, New Bridge-street.

entrance is by a porch on the south side, on each side of which are the heads of the bishop and the founder,—good likenesses. Internally, the church consists of a nave, with an arcade on the north side, a choir beneath the tower, with transepts and a sacrarium. The nave is lined with stone, which is of a light green, with bands of pink alabaster (Penarth) and a dark red stone. The roof is of oak; the benches are of oak, boldly moulded and carved. The whole of the pavement is glass mosaic. The tower arches spring from corbelled shafts with spirited carved caps; the shafts spring from the heads of the four Evangelists with their insignia; those on the north and south rest on a king, queen, bishop, and a warrior. The roof under the tower is groined in coloured stone. The stalls are of oak, doubly arcaded with cusped arches, and carved in the spandrels,—the backs are partly opened to the transept; there is an ascent of seven steps of polished Devonshire marble. The chancel is inclosed by brass gates; the mosaic floor here is very rich in colour and design. The walls are almost entirely of pink alabaster, with a few bands of green and red stone. On the south are the sedilia and credence, gabled and crocketed above, with green and white marble shafts and carved caps; on the north side is a handsome sepulchral recess for the founder's tomb. The reredos consists of an arcade of alabaster the whole width of the chancel, boldly moulded and carved, gabelled and crocketed above, supported by shafts of green and white marble, with carved caps and bases of green stone. The three arcades above the altar are corbelled off to admit of a marble slab incised in black and white (subject, the Resurrection). The design for this was by Mr. Armstead, R.A. The roof is panelled with ribs springing from angels holding emblems of the Passion. The pulpit is octagonal, with moulded and tracery panels in red sandstone: above is a rich moulded and carved cornice in alabaster; the stem of the centre pillar and eight columns, with crocketed gables springing from heads; the centre panel is a sculpture of Christ dispersing his disciples ("Go ye and teach all nations"). The south is of greenstone inlaid with alabaster, supported on eight pillars, with boldly-carved cluster caps.

The organ is by Mr. Willis; the stained glass by Messrs. Morris & Co.; the wood and stone carving by Mr. Wormleighton, of Cardiff; and the bells are by Mr. Taylor, Loughborough.

## CHURCH OF ST. JOHN THE EVANGELIST, ASTHALY, NEAR WITNEY.

THE above church has lately been enriched by the filling with stained glass of the west window, as a memorial to the late Mr. John Collier, of Salters' Hall, City. The two lights contain allegorical figures of Faith and Hope, draped mainly in white, which are well thrown up, being set in a richly-coloured background having vine-leaves and branches running through it. Under the respective figures are the texts, "Watch, stand fast in the faith," and, "For in thee, O Lord, do I hope." The tracery piece between the lights contains the figure of an angel, with emblems, treated on a background to agree with the lights. Beneath the window is a brass plate, bearing the following inscription:—"To the glory of God, and in memory of John Collier, who fell asleep on the 3rd day of June, 1881, aged 53 years."

The work has been carried out in the fourteenth-century style, to accord with the architecture, and is by Messrs. John Hardman & Co., of Birmingham.

## WIESBADEN RATHHAUS.

THE readers of the *Builder* were informed at the time that the municipal authorities of Wiesbaden had opened a prize competition for a new Rathhaus or town-hall for that city. The number of architects applying for the programme of particulars has been very large, upwards of five hundred having already been despatched. The applicants are not confined to Germany, but a considerable contingent belong to Austria, England, Switzerland, Belgium, Russia, and Italy. Since public notice was given of the Wiesbaden competition, the much more important contest has been opened for designs for the new Imperial House of Parliament for Germany. As the time for the sending in of the drawings for the latter scheme is fixed for June 10th, and as the competition is limited to German architects, all the most eminent of whom are expected to participate in it, the Wiesbaden authorities have resolved to extend the time allowed for sending in designs for their new Rathhaus from the 15th of July to the 15th of September next.

## LEYLAND LOCAL BOARD: COMPETITIVE SCHEME.

THE Board having recently invited engineers to send in plans and estimates of the cost of the whole of the works necessary for the water supply of this district, the following gentlemen submitted schemes, viz.:—Mr. Henry Bancroft, Manchester; Mr. P. L. Edinger, Walton-le-Dale; Messrs. Gotto & Beesley, Westminster; Messrs. Goodison, Atkinson, & Ford, Liverpool; Mr. Joseph Harding, Preston; Mr. George Heaton, Wigan; Messrs. Moorson & Sacrè, Manchester; Mr. Alfred Moore, Manchester; Mr. E. Timmins, Runcorn; and Mr. William Wrennall, Liverpool.

The Board ultimately, at their meeting on the 16th inst., decided to adopt the scheme submitted by Mr. William Wrennall, Liverpool, who is consequently selected to carry out the works.

The scheme submitted by Messrs. Goodison, Atkinson, & Forde was considered to be second in merit, and they were awarded the sum of 20*l*.

## NEW THEATRES.

THE public demand for new theatres appears to be as yet unsatisfied, in spite of the numerous additions that have been made to their number. The Royal London Panorama, on the north side of Leicester-square, the site of which was formerly occupied by Savile House, and where the Panorama of the Battle of Balaclava was recently exhibited, is about to be converted into a theatre, under the title of the Pandora Theatre. Plans have been prepared for this purpose by Mr. Thos. Verity. The theatre, which will contain about 2,000 persons, will have ample corridors and staircases, with additional exits into Lisle-street, in the rear.

Another theatre is also proposed to be built on the south side of the Strand, on the site of No. 106, Strand and the Occidental Tavern, Fountain-court.

## OBITUARY.

*Mr. Henry Alty, C.E.*—The inhabitants of Plymouth learned with no ordinary pain of the death of Mr. Henry Alty, the Borough Surveyor. The event was sudden. The deceased gentleman was but thirty-eight years of age, but leaves a wife and a family of eight young children to lament the untimely calamity. Mr. Alty was elected rather over three years since to the office of Borough Surveyor. There were several candidates for the post, all highly recommended. Mr. Alty, who was a native of Wigan, and who had been holding a less responsible position at Barrow-in-Furness, prepossessed the Council by his air of business-like capacity and appearance of quiet confidence. He was busily engaged at the time of his death in conducting on behalf of the town the negotiations connected with the drainage of Compton, and in the matter of public improvements he entertained the strength of his convictions, and was never without a strong following.

*Mr. Archibald Semple Anderson.*—On Friday in last week, Dr. Thomas, Coroner for Central Middlesex, opened the inquest at 138, High-street, Camden Town, on the body of Mr. Archibald Semple Anderson, aged 27, who was killed on the previous evening by falling from the roof of the above-named house, the residence of his father. Mr. Alexander Anderson identified the body as that of his brother, who had been in ill-health latterly, and under the care of Dr. Miller, of Hampstead. That gentleman saw him on the day of his death, and recommended change of air and a sojourn at Hastings. Witness last saw him alive at dinner-time on Thursday, when he seemed exceedingly melancholy. He had been upset in his mind lately, and working hard at his studies as an architect. At five o'clock on Thursday evening, witness saw a crowd in the street, and then found that his brother had fallen or thrown himself from the top of the house, and was lying dead in the roadway. He had had no reason for suspecting that his brother would commit suicide. Mr. Alexander Anderson, senior, the father of the deceased, gave further evidence to the same effect. The jury returned a verdict of "Suicide while of unsound mind."

## THE BOARD OF WORKS AND NEW ROADS.

AT the Greenwich Police Court, Chas. Pearce, of Havelock-road, Forest-hill, builder, was summoned by the Board for not making a street, called Pearcefield Avenue, David's-road, Forest-hill, with two entrances, as required by 25 & 26 Vic., c. 102, s. 98, and the Board's By-law.

Mr. Burton, solicitor, appeared for the Board, and Mr. Firth, M.P., for the defendant.

The facts of the case were as follow:—Mr. Pearce had applied to the Board for their sanction to the above street with one entrance, which application was refused. Notwithstanding this, he proceeded to build and lay out the road. Finding, on the 1st of March, that proceedings were about to be taken, he put up a hoarding, and wrote on it, "Pearcefield Avenue,—Private Road."

Mr. Firth, on the part of the defendant, contended that the Board had no power to interfere, the road being a private one; that the section of the Act did not apply; and that the By-law was *ultra vires*.

On behalf of the Board it was contended that the Board had the power to compel the road being made with two entrances after the defendant's application to the Board, and the case of "The Metropolitan Board of Works *v.* Steed" was cited as being similar in principle, and that the By-law was a good one.

Witnesses having been called, the defendant consented to make the two entrances, and the case was adjourned for nine weeks to enable the work to be carried out.

## BRICKS.

SIR,—Can any of your readers refer me to any works where waste heat is utilised for drying bricks? P. P. C.

## COLOURING PORTLAND CEMENT.

SIR,—About two years since I erected a small building to be used as a hospital for infectious diseases.

It is built of bricks, and the walls inside are rendered and set with Portland cement, which has not dried all the same colour, but in large spots or stains,—very much resembling damp,—which are perfectly dry, sound, and hard.

Can any of your readers recommend me the best kind of material for coating or painting such walls, impervious to necessary washings?

W. S. M.

## A WORD TO THE MASTER BUILDERS.

SIR,—Being a practical man of considerable experience, I wish to say a word to the master builders through your pages, for they do not appear to see their own interest.

It is now getting very general to appoint a general foreman. That, sir, is the greatest mistake possible, for there is not a man to be found capable to fill such an appointment. It is not to be supposed that there is a man living that is thoroughly practical in all the building branches.

When a man of that description undertakes to tell practical workmen how to do their work, I think, sir, you will say with me that it is not to the interest of the employer, but quite to the contrary, and also a great insult to a man who knows his business to be made to work according to his directions; but the workman must do so.

Why do not the master builders act generally in the same manner as the late Cubitts, Petos, and Myers used to do, viz., appoint a thoroughly practical foreman over each trade? Work would then be done as it used to be, in a proper manner.

But now many masters are getting into the building line who have no general knowledge of the business, and they appoint these general blockheads?

The consequence is that alteration after alteration takes place, work is messed about, labour is spent in vain, and eventually many masters are brought to ruin, and the employers are charged extra for this mismanagement.

T. M.

## DECAY OF BUILDING MATERIALS.

SIR,—I have read the letters of your correspondents on skilled labour and the use of inferior materials, that causes such rapid decay in the buildings erected during the last twenty years, but I have not observed any remarks as to why the masonry externally disintegrates so rapidly at the present time, as compared with that in ancient buildings, or St. Paul's, Greenwich Hospital, and the Reform Club, to wit. I think it is also desirable, in connexion with the present subject, that some of your correspon-

dents should also give their opinion and experience as to whether the application of machinery disturbs the face of building stones, and causes the rapid decay observable in buildings of recent date.

G. R.

## CHURCH-BUILDING NEWS.

*Cowley St. John (Oxon).*—The new district Church of Cowley St. John is situated in the Cowley-road, in close proximity to the University Cricket Ground and National Hospital for Incurables. The style is Early Decorated, the walls being of Charlbury stone, with Box Ground weather stone external dressings, and Corsham Down stone internally. The chancel was built seven years ago, and the remainder of the church will be in accordance with it in style. The church will accommodate 730, and consists of nave, 69 ft. by 25 ft.; north and south aisles, 54 ft. by 12 ft.; north and south transepts, 14 ft. by 15 ft.; tower, 16 ft. square; vestry, 17 ft. by 17 ft.; organ-chamber, 17 ft. by 8 ft. The tower is at the west end, and when completed its total height, with spire, will be 183 ft. It will have a wooden polygonal panelled roof inside; its height in nave from floor level to ceiling will be 43 ft. There will be five bays in good proportion on each side of nave, with an arcaded clearstory above. The nave is to be commenced at once. Mr. Mardon Mowbray is the architect.

*Greatworth.*—St. Peter's Church, Greatworth, was reopened on February 17th, after restoration. The church consists of a chancel, nave, and tower at the west end. The structure is a small one, the nave being 33 ft. by 24 ft., and the chancel, 20 ft. by 17 ft. The chancel is of Early English work, but the nave is modern. The old west gallery has been removed, and a ringing-chamber substituted, and underneath there is a vestry. The chancel-arch is new, and the chancel itself has been raised two steps. The old high pews in the nave and chancel have been replaced by new seats of pitch-pine. The chancel and the aisle are paved with Webb's Worcester tiling, and the other parts of the flooring are laid with ash blocks, set in concrete. The old pulpit has been retained. The restoration is estimated to cost 400*l.* The architect employed in the work is Mr. H. R. Gough, of London. Mr. Cotterill, of Culworth, was the builder.

*Hedworth.*—The new Church of St. Nicholas, Hedworth, South Shields, was consecrated on February 17th. The new church consists of a nave of four bays, 67 ft. by 21 ft. internally, and a north aisle, 65 ft. by 8 ft. It is intended, as soon as the funds can be raised, to complete it by adding a chancel, 28 ft. long, with organ-chamber and vestry on its north side, and also a south front to the nave. The building is of stone, in the Decorated style, and has open roofs of unvarnished deal, covered with red tiles. The seats and other fittings are also of deal, rubbed with bees'-wax, but not varnished. The whole of the work has been carried out by the contractor, Mr. W. Foster, of Croxdale, from the designs and under the supervision of Mr. C. Hodgson Fowler, architect, Durham. The altar-cloth was supplied by Mr. W. E. Earle, of Durham, under the architect's directions.

*Cheshire.*—The annual meeting of the Cheshire Diocesan Church Building Society was held in the Chapter-house, Chester Cathedral, on the 23rd ult. The report stated that the following grants have been made during the past year:—St. Matthew's, Birkenhead, where it was proposed to build a new church at an estimated cost of 4,500*l.*, a grant of 160*l.* St. Thomas's, Chester: Application was made for assistance in the enlargement of this church, and a grant of 160*l.* was made; the increase of sittings was 320. St. Paul's Church, Coppenhall, Crewe: A grant of 75*l.* was voted towards the cost of a new south transept, setting free 150 sittings. Winck: A grant of 75*l.* was made towards a new church in the place of a much dilapidated old one.

*Newburgh (N.B.).*—At a recent meeting of the heritors of the parish of Newburgh, Mr. John Young, C.E., explained the proposed alterations and repairs on the church, and it was agreed that the seats be remodelled, provided the congregation approve; also that the sounding-board and the back of the pulpit be removed, and the pulpit lowered 9 in. The offer of Mr. Livingstone, merchant, Edinburgh, to put in a stained-glass window on the south side of the church, which fronts the street, was accepted. Mr. Edgar showed a sketch of the design for the window, being subjects from the life of Jesus Christ. The design was approved. The total estimated expense of the alterations, not including the stained-glass window, is 250*l.*, which has been nearly all subscribed.

*Plymouth.*—The new Church of St. Peter, Wyndham-square, Plymouth, has been consecrated. The style is Early English. On the ground plan the building shows a wide nave and aisles, with north and south double transepts, and chancel. The tower is 32 ft. square, and is eventually to be carried one stage higher than it is at present. The tower entrance, which faces Stoke-road, is a main feature of the building. There is a porch in the thickness of the tower, and the tympanum over the double doorway is eventually to be filled in with mosaic. There is a narrow balcony over this western door which can be used for the purpose of preaching on the occasion of overflow or mission services. In this lower stage of the tower is a large double traceried window, and the bell-ringing stage is marked by narrow arcaded lights. The south porch is not yet built, but it will eventually be the principal entrance, and will be rich in carved stone and with figure sculpture over the doorway. The double transept on the south side will have an aspidal chancel. The sacrarium of the old church, built from designs by the late Mr. Street, is retained, and the chancel is under the main roof, so that all the lines of the nave roof run from end to end and give greater idea of length. Subjects from the life of St. Peter will be painted on the panels, at present plastered, between the nave arcade and clearstory. Twelve niches, six on either side, over the arcade dividing the nave from the transepts, will eventually be filled with sculptured figures of the Apostles, and the angles of the chancel are marked by four angels holding different instruments. The windows are nearly all designed to be filled with stained glass; two in the south transept are in hand, being painted by Mr. William Bell, and the whole of the windows in the transept are to contain subjects connected with the Holy Eucharist. There are to be seven lancet lights in the aspidal end of the chapel. The windows in the aisles will contain representations of the miracles of our Lord, and in the windows of the west end of the aisles there will be in one "The Baptism of Our Lord," and in the other "Jesus Blessing Little Children." In the tower window there will be a representation of the descent of the Holy Ghost. Four coronæ which light the chancel are the special gift of a lady. The architect is Mr. G. Fellowes Prynne, the son of the vicar, and the builder was Mr. Alfred Guy, of London. The stonework was done under the foremanship of Mr. Ells. The glazing of the windows with tinted glass is the work of Messrs. James & Co., of London, and the wrought-iron work was supplied by Messrs. Brawn & Co., of Birmingham, and Messrs. Ellis & Rice, of London, the latter firm having in hand a wrought-iron screen to be presented by Mr. Swan. The heating apparatus is by Mr. Grundy, of London. The gilt coronæ were manufactured by Messrs. Singer & Co.

*Noss Mayo.*—The new church here, which is being erected by the munificence of Mr. Edward Charles Baring, of Membland Hall, is, so far as the actual fabric is concerned, almost complete. It is expected that the consecration will take place on the 29th of June, the festival of St. Peter, the saint to whom the church will be dedicated. The structure is situated upon the steep hill slope and on the Revelstoke side of the lovely combe through which the Yealm meanders. The building is Perpendicular in style, and, at the express wish of the donor, is altogether a counterpart of a fine old fifteenth-century West-country church. The architect is Mr. James Piers St. Aubyn. Mr. Baring's own staff of workmen are building the church, under the superintendence of Mr. T. W. Crosbie, the clerk of works to the estate. The church is built of local dun stone, with dressings of grey Dartmoor granite standing out sharply upon the rugged slope. It has a western embattled tower, with a turret rising above its battlements at the north-west corner. The body of the building consists of nave and north and south aisles, divided, certainly, by arcades of granite, all the columns supporting which are monoliths. The fall in the ground gives an opportunity for the formation of a crypt upon the north side, and Mr. St. Aubyn has utilised this peculiar formation in the site by placing the vestries and choir-rooms below the north aisle. The approach from these apartments to the chancel is by a broad winding staircase. All the windows are full of tracery, and this is wrought, like the rest of the masonry, in Dartmoor granite. In the aisles the windows are three-light, and the chancel east window is a five-light one, and the tower window has four lights. The roofs are covered in by slates raised at Worsewell Point, on Mr. Baring's estate. The east and west, as well as several other of the windows, are to contain painted glass by Messrs. Fouracre & Watson. The roofs are wagon-shaped, and, like the rest of the woodwork, are all framed out of "hearts of oak." The various intersections are stopped by carved bosses, the work of Mr. Harry Hems, to whom the whole of the carved and sculptured work has been entrusted.

## Books.

*An Elementary History of Art: Architecture, Sculpture, Painting.* By N. D'ANVERS. Second Edition. With Preface, by Professor ROGER SMITH. London: Sampson Low & Co. 1882. THIS thick volume, of nearly 700 pages, which is referred to in the introduction as "this little book," is a publication which, founded on a German original, comes under the class of works which arise out of the process sometimes called "book-making." For a volume which has not, and does not profess to have, a single original idea or statement, we should be inclined to say, "something too much of this." The now general idea that one ought to know something about art has led to the production of a good many handbooks of this class, the use of which lies in their supplying the superficial facts in a superficial manner for those who want to get a little knowledge about the arts without much trouble or thought. We cannot say that we are much in favour of such books, to the production of which some labour certainly goes, but which are written mostly with as little expenditure of real thought as goes to the reading. The present work may be said to be a favourable specimen of its class, but we can hardly give it more special commendation than is implied in saying that Professor Roger Smith, in his brief introduction, makes what he considers an excuse for this superficial character of the book, which he can hardly avoid admitting, by observing that the present movement in favour of the arts is an essentially popular one, and that therefore nothing could possibly be more suited to the wants of the day than the publication of works on the fine arts calculated to give sound information in a popular form. We should have said that if the present generation were disposed to prate about art in a very superficial manner, they were rather in want, intellectually, of publications which would lead them to think a little more deeply on such subjects. In a commercial sense, no doubt, the conclusion suggested in the introduction may hold good.

The unsatisfactory result of dealing in this popular and superficial manner with architecture, for example, is shown in various passages in the portion of the work devoted to that art. There is at page 88, for example, a show of explaining one of the chief formative causes of Gothic architecture, the difficulty of adjusting vaulting surfaces and their curves of intersection, but no diagram is given, the explanation is brief and incomplete, and no one who is not already acquainted with the subject will be likely to derive any clear idea of what is meant from the passage. Indeed, an incorrect idea is conveyed, and a semi-popular fallacy supported, in saying that "pointed arches are capable of being applied to vaulting bays of any shape or size, as they can be made of equal height whatever their span." This implies that the problem of making the various lines of vaulting work together was entirely solved by the pointed arch, whereas the solution was still theoretically incorrect, and sufficiently so practically to lead to a great deal of trouble in attempts to "fudge" the curves so as to make them work into each other, which the fan-vault only at last achieved. A few scientifically-worded sentences and two or three small diagrams might have rendered this and other points in regard to this important part of Gothic architecture intelligible to those readers capable of understanding it at all (there are many among average readers who never understand anything of that kind, however demonstrated); but the information given here conveys nothing distinct. But these formative causes in architecture are regarded with much interest by amateurs of intelligence

when fairly set before them. We have been witness of the interest with which people who had long looked at Gothic buildings sympathetically but superficially received the explanation, for instance, of the genesis of the moulded arch from the soffit-arch of the Roman and Romanesque period, shown in half a dozen chronologically arranged sections; this one little bit of demonstration evidently giving them a good many new notions about what Gothic architecture meant. A more carefully-worded and concise treatment of the subject might have brought out important points like these, without any undue lengthening or elaboration. In regard to some points of architectural history light is let in upon the average reader. The idea, for instance, that the chief interest of Roman architecture consists in the fact that it was a combination and transition style, and formed the connexion between Greek and Mediæval architecture, is one of which few people who have not professedly studied architecture have any inkling; and with this and other general truths as to architectural history the book may usefully inoculate them. But in details the architectural portion of the book is poor, and occasionally what may be called slipshod in expression. For instance, the Parthenon is said to be in the "peripteral style," which at once produces a confusion between two different uses of the word "style." It should have been the "peripteral form" (or "plan"), which might have been in any of the Classic "styles." But the treatment of Greek architecture generally is inadequate, and deficient in critical perception and precision.

The portions of the work which deal with painting and sculpture give a considerable quantity of historical information which is useful in itself, and might have been made as useful and compressed into a smaller space by the omission or curtailment of a good many of the critical reflections on various great artists, which do not form very valuable reading. Sculptors of the present day,—those now living, that is to say,—are mentioned, but (intentionally) not criticised or characterised. Painters now living are not mentioned. Why they should not have the same degree of notice as sculptors we do not understand. Grinling Gibbons, by the way, is hardly to be called a sculptor, in the sense in which the word is usually understood. He was a carver of genius rather than a sculptor. A writer who couples the names of Canova and Flaxman as if they were kindred spirits has not a very true perception as to what makes the greatness of sculpture, or of a sculptor; and the omission of the name of Dalou altogether from the list of modern French sculptors is incomprehensible.

However, although we cannot point to the work as supplying exactly the handbook just now wanted, the general reader may find it an agreeable introduction to other and more precise guides on the subject of which it treats.

## VARIORUM.

BERLEY'S "British and Continental Electrical Directory and Advertiser" (16, New Bridge-street), 1882, shows the astounding progress made lately in electrical science, and the large number of industries it has already brought into existence. We cannot agree with the editor in his condemnation of those inventors who are still trying to introduce certain systems of lighting dependent on the employment of electric batteries. Improvement or discovery in this direction might very much facilitate domestic lighting. Thousands of billiard-rooms, for example, in private houses, at present scarcely usable because of the heat and bad air, are waiting for arrangements that would admit of the introduction of electric lighting.——"Useful Information on Electric Lighting," by Killingworth Hedges (Spon), 1882, has reached a fourth edition, and now includes a chapter on the transmission of power.——More sixpenny books, and a good job too. We have before us Col. Burnaby's dashing "Ride to Khiva" (Cassell & Co.), "Hood's Own," full of funny cuts (Ward, Lock, & Co.), and, from same publishers, "Out of the Hurly-burly," by Max-Adeler, with all the original engravings, good, bad, and indifferent.——"*Fun's* Academy Skits, 1881," sketched by Gordon Thomson, with notes by Nestor, are devoid of malice and not without fun.——"Wholesome Houses: a Handbook of Domestic Sanitation," by E. Gregson Banner, C.E., revised edition (Stanford), 1882, is devoted, as might be expected, to an exposition and recommendation of the Banner system. Those who wish to understand all about it will find it here.

## Miscellanea.

**Payment of Wages in Public-houses Prohibition Bill.**—A Bill has been introduced into the House of Lords by Earl Stanhope and read a first time, the object of which is to extend the operation of the Coal Mines Regulations Act, 1872, and the Metalliferous Mines Regulation Act, 1872, prohibiting the payment in public-houses, beer-shops, or other places mentioned therein, of wages to persons employed in mines, so as to prevent the payment of wages in public-houses to all workmen whatsoever. The third clause is as follows:—"From and after the passing of this Act no wages shall be paid to any workman at or within any public-house, beer-shop, or place for the sale of any spirits, wine, cider, or other spirituous or fermented liquor, or other house of entertainment, or any office, garden, or place belonging or contiguous thereto or occupied therewith. Every person who contravenes, or fails to comply with, or permits any person to contravene or fail to comply with this Act, shall be guilty of an offence against this Act. And in the event of any wages being paid by any person in contravention of the provisions of this Act for or on behalf of any employer, such employer shall himself be guilty of an offence against this Act, unless he prove that he had taken all reasonable means in his power for enforcing the provisions of this Act, and to prevent such contravention." The penalty for infringing the Act is not to exceed 10*l.* for each offence, and all offences against this Act may be prosecuted and all penalties under the Act may be recovered by any person summarily under the Summary Jurisdiction Acts. The Act is not to apply to Ireland.

**Erecting Wrought-iron Chimneys.**—A novel plan for erecting the casings of fire-brick hot-air stoves and wrought-iron chimneys is being pursued at the Pennsylvania Steelworks, Harrisburg. Two new blast-furnaces, with six Whitwell stoves, 60 ft. high and 18 ft. diameter, are in course of erection there. Instead of putting the bottom plates of the stove together on the ground, and building the rings up from the bottom to top, at the works mentioned a commencement is made with the top plates and top ring of the stove. They are first erected on the ground, and riveted and caulked complete; then with three very large screw jacks, having a lift of about 6 ft., and placed at equal distances around the site of the stove, worked by men with winch-handles, this first ring is carefully and evenly lifted high enough to enable the workmen to put on the next ring of the plates, 5 ft. deep. This ring is also riveted and caulked complete; then another ring is added and lifted, and so on till the whole stove is completed. The wrought-iron chimney, 175 ft. high, for working these stoves, was erected in the same way.—*Iron.*

**St. Paul's, Hammersmith.**—A faculty has been obtained for the removal of this church, and to build a new church in its stead. The vicar, one of the churchwardens, and the architect of the proposed new church, were called in support of the application, which the parish at a vestry meeting had resolved upon. The expense of the whole was estimated at 16,400*l.*, and 6,500*l.* had been subscribed towards the erection of the new nave, where the services would be performed without pulling down the whole of the old church. The nave would cost 7,400*l.*, and there would be no difficulty in raising the balance, and when required the additional outlay for the new chancel and the proposed tower will be raised by voluntary contributions. There will be about 700 additional sittings.

**Ship's Self-registering Compass.**—A new, and what promises to be an important invention, has just been made by Mr. Robert Pickwell, civil engineer, Hull, and consists of a self-registering ship's compass, by means of which a diagram is produced, showing,—1. The exact steered course of the ship; 2. The length of time the ship has been kept on any course; 3. All the changes of the courses, and the exact time when such changes take place; 4. In the event of a collision at sea, the bearing of the ship's head at the time is clearly shown. The instrument will be on exhibit at the Naval and Submarine Engineering Exhibition, to be held next month at Islington.

**Proposed Hospital at Rugby.**—We understand the design of this work has been entrusted to Mr. Henry Wilson, architect, of Great James-street, Bedford-row.

**Steeple Claydon Church.**—A fine turret clock, showing time on one dial, has just been fixed in the tower of this church. Its manufacture was entrusted to Mr. J. W. Benson, of Ludgate-hill, and it is the gift of Sir H. Verney, bart. The clock strikes the hours on the tenor bell, weighing 16 cwt. The whole of the wheels are of hard brass, the main wheel measuring 14 in. in diameter, and, as usual with most clocks made by this firm, the escapement is a Graham's dead beat. The pendulum is 7 ft. long, and beats 1½ second of time with a bob weighing 1¼ cwt.

**Royal Avenue Theatre.**—As some of the newspapers have described the front of this theatre, on the Thames Embankment, as being constructed of Portland stone, we are asked to contradict this and say the material used is the "corn-grit and bottom-bed" stone produced by the Corsham Down Quarry, in Wiltshire, belonging to Messrs. Yockney & Co., who supplied it to the contractors, Messrs. Kirk & Randall, under the architect's specification.

**The Air Within our Dwellings.**—In the report of the discussion on this subject at the Civil and Mechanical Engineers' Society, Mr. H. H. Collins was made to speak of "Wake's hydrostatic calorific stove" as a means of introducing fresh warm air into rooms. What Mr. Collins really referred to was "Weeke's hydro-caloric warming and ventilating coil." We learn that a number of these coils are now being fixed for the purpose of warming and ventilating the new Synagogue, St. John's Wood, which is being built under Mr. Collins's direction.

**Asphalte Paving.**—We may add to our notice of the works done at the new Vestry-hall, Bermondsey, that the whole of the asphalting,—viz., damp-course, and paving of the entire building,—was laid by the Brunswick Rock Asphalt Paving Company (Limited). The whole of the new platforms of the King's-cross Goods Station (3,000 superficial yards) are being laid with Brunswick Rock Asphalt, 1½ in. thick, for the Great Northern Railway Company.

**Salwarpe.**—New National schools here will shortly be opened. They occupy a site which was the gift of Mr. R. A. Gresley, to the parish, and the premises comprise a "mixed" school-room, upwards of 42 ft. long by 18 ft. 6 in. wide, and a classroom, 20 ft. long by a similar width. There are also porch, lavatory, out-offices, &c. The contractors are Messrs. Read & Cook, of Bromsgrove. The architect is Mr. John Cotton, of Birmingham. The cost will be about 1,100*l.*

**City Property.**—An important block of freehold property, situated in Tokenhouse-yard, was sold by auction, at the Mart, last week, by Messrs. Farebrother, Ellis, Clark, & Co. The premises have two frontages to thoroughfares. The area occupied by the building is about 3 250 ft., and the rental value was estimated at 5,000*l.* per annum. The property realised 61,000*l.*

**The late Mr. Burges, A.R.A.**—At the sale on the 20th, by Messrs. Puttick & Simpson, of a portion of Mr. Burges's library, his little vellum book of sketches produced 285*l.*; his collection of original measured drawings and sketches, in 25 vols., 286*l.*; while many of the less important lots likewise realised high prices.

**Royal Society.**—The President and Council will hold a reception at Burlington House on Wednesday, 29th inst. This gives an opportunity for the introduction to the President of eminent men known to Fellows, but they must be personally presented. Cards have been issued for the annual *conversazione* on May 10th.

**The Memorial Stone** of the Brentford Union Schools, Isleworth, was laid on Thursday last by Mr. John M. Stedwell, Vice-chairman of the Board of Guardians. Mr. Edward Monson, jun., A.R.I.B.A., of Acton, is the architect, and Mr. Thos. Brunsden, of Brentford, is the builder.

**Manora Breakwater, Kurrachee.**—Mr. Price writes to correct a statement in his letter (p. 331, *ante*). His paper was read at the Institution of Civil Engineers in 1875–6, not 1874–5.

**Two Churches** built by the Sheffield Church Extension Society have just been consecrated by the Archbishop of York. They are both constructed of brick, and have been erected from designs by Mr. J. D. Webster, of Sheffield.

**A New Presbytery** is to be erected at Cleator, Cumberland. It will be built from the designs of Messrs. Pugin & Pugin, Westminster.

**Society of British Artists.**—The private view at the Suffolk-street Galleries will take place this Saturday, the 25th inst.

**Patent Law.**—The Society of Arts Bill for the Amendment of the Patent Law has been brought in by Sir John Lubbock, M. W. H. Smith, and Mr. J. C. Lawrence, Q.C. The second reading of the Bill is set down for Wednesday, April 5.

## TENDERS

For the erection of Walkington Towers, near Beverley, for Mr. John Shan, of Swanland. Mr. Robert Clamp, architect. Quantities supplied:—

| | |
|---|---|
| Nickolson & Son, Leeds | £11,274 13 7 |
| W. Wilson & Sons, Hull | 10,600 0 0 |
| John Wilson & Son, York | 10,373 15 5 |
| T. P. Barry, York | 9,913 18 9 |
| J. & W. Stamp, Barton-on-Humber | 9,894 2 1 |
| Blackburn, Hull | 9,874 14 9 |
| Chadwick & Sons, Dewsbury | 9,580 0 0 |
| R. Habbershaw & Son, Hull | 9,444 17 0 |
| J. & W. Beanland, Bradford | 9,429 0 0 |
| Holdsworth, Bradford | 9,395 0 0 |
| Simpson & Malone, Hull | 9,205 2 5 |
| Brelsford, Wetherby | 9,178 0 0 |
| Drury, Hull | 9,171 7 0 |
| Clarkson & Son, Hull | 9,038 16 7 |
| W. Dennison & Son, York | 9,120 0 0 |
| R. Sergeant, Hull | 9,030 0 0 |
| Longley Bros., Leeds | 8,780 16 6 |
| Bentley & Burn, Leeds | 8,720 0 0 |
| Musgrave, Hull | 8,700 0 0 |
| R. Pape Gaud, Beverley | 8,661 10 0 |
| J. H. Thorp, Leeds | 8,599 15 0 |

For the erection of the White Lion public-house, Southall, Middlesex, for Mr. Wm. Gomm. Mr. Edward Monson, jun., architect:—

| | |
|---|---|
| T. Brunsden, New Brentford | £1,050 0 0 |
| J. Dorey, Old Brentford | 1,029 0 0 |
| T. Nye, Ealing | 997 0 0 |
| C. Maton, Kew | 995 0 0 |
| G. Gibson (accepted), Southall | 968 0 0 |

For the erection of Board Room and Relief Offices for the Brentford Board of Guardians, Isleworth, Middlesex. Mr. Edward Monson, jun., architect:—

| | |
|---|---|
| Bloomer, Brentford End | £5,895 17 2 |
| W. Wisdom, Isleworth | 5,118 0 0 |
| Lucas & Son, Kensington-square | 5,050 0 0 |
| G. Reavell, Staines | 4,990 0 0 |
| Hiscock, Hounslow | 4,700 0 0 |
| H. Haynes, Alperton | 4,650 0 0 |
| Wilkinson Bros., Finsbury Park | 4,476 0 0 |
| D. Ireson, Northampton | 4,340 0 0 |
| Joseph Dorey, Old Brentford | 4,269 0 0 |
| M. W. Rowles, Acton | 4,150 0 0 |
| Thomas Brunsden, New Brentford, (accepted) | 4,127 0 0 |
| W. H. Wheeler, Ravenscourt Park, (withdrawn) | 2,980 0 0 |

For the erection of house in Friend's-road, Croydon, for Mr. R. Walker. Mr. F. West, architect:—

| | |
|---|---|
| Ward, Warningham | £1,499 0 0 |
| W. Marriage, Croydon | 1,435 0 0 |
| T. Bristby, Croydon | 1,311 0 0 |
| S. Page, Croydon | 1,300 0 0 |
| Maides & Harper, Croydon | 1,295 0 0 |
| H. Legg, Croydon | 1,193 0 0 |
| J. Horrocks, Croydon | 1,106 0 0 |

For the erection of two shops in North End, Croydon. Mr. F. West, architect:—

| | |
|---|---|
| S. Page, Croydon (accepted) | £1,225 0 0 |

For alterations and additions to St. Paul's-road Schools, Limehouse. Mr. E. R. Robson architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

| | |
|---|---|
| S. J. Jerrard | £4,569 0 0 |
| Wm. Oldrey | 4,493 0 0 |
| J. R. Hunt | 4,335 0 0 |
| T. Boyce | 4,160 0 0 |
| C. Cox | 4,100 0 0 |
| G. F. Sargeant | 3,989 0 0 |
| Atherton & Latta | 3,895 0 0 |

For new Board Schools at Latchmere-road, Battersea, in the Lambeth Division, for the School Board for London. Mr. E. R. Robson architect. Quantities by Mr. W. H. Barber:—

| | |
|---|---|
| G. S. Larke & Son | £15,938 0 0 |
| Wall Bros. | 15,285 0 0 |
| W. Scrivener & Co. | 15,279 0 0 |
| J. Oliver | 15,186 0 0 |
| W. Brass | 15,168 0 0 |
| Perry & Co. | 15,161 0 0 |
| J. Marsland | 15,055 0 0 |
| B. E. Nightingale | 14,984 0 0 |
| Higgs & Hill | 14,934 0 0 |
| Kirk & Randall | 14,930 0 0 |
| Wm. Oldrey | 14,797 0 0 |

For the extension of Board Schools at Prince's-road, Finsbury, for the School Board for London. Mr. E. R. Robson, architect. Quantities by Messrs. Northcroft, Son, & Neighbour:—

| | |
|---|---|
| Merritt & Ashby | £7,861 0 0 |
| W. Scrivener & Co. | 7,810 0 0 |
| G. S. Pritchard | 7,735 0 0 |
| F. Boyce | 7,662 0 0 |
| G. S. S. Williams & Son | 7,632 0 0 |
| L. H. & R. Roberts | 7,589 0 0 |
| Wm. Oldrey | 7,479 0 0 |
| E. Lawrance | 7,477 0 0 |
| J. Grover | 7,373 0 0 |
| W. Shurmur | 7,335 0 0 |
| J. F. Sargeant | 7,275 0 0 |
| Stimpson & Co. | 7,270 0 0 |
| Wall Bros. | 6,987 0 0 |

For sundries, alterations, and additions at 97, 99, 101, 103, and 105, Ossulton street, Somer's-town, for Mr. Von Joel. Mr. W. J. Miller, architect:—

| | |
|---|---|
| Fawkes | |
| Adams | £1,050 0 0 |
| Jackson & Todd | 1,015 0 0 |
| Royal | 900 0 0 |
| Spencer & Co. (accepted) | 866 0 0 |
| | 810 0 0 |

For alterations and additions to the George the Fourth, Duke-street, for Mr. Stevens:—

Royal (accepted).

For a house at Orpington, Kent, for Mr. A. Brown. Mr. G. St. Pierre Harris, architect:—

| | |
|---|---|
| Lowe | £959 0 0 |
| Wright | 955 0 0 |
| Wood | 827 0 0 |
| Taylor & Son | 798 0 0 |
| Haisman | 697 0 0 |

For additions, alterations, and repairs to the Maxwell Arms, Orpington, for Messrs. J. Fox & Sons. Mr. G. St. Pierre Harris, architect:—

| | |
|---|---|
| Haisman | £745 0 0 |
| Taylor & Son | 714 0 0 |
| Wood (accepted) | 645 0 0 |

For entrance gates, front fence, and laying-out grounds, &c., at Starts Hill, Orpington. Mr. G. St. Pierre Harris, surveyor, &c.:—

Haisman (accepted).

For alterations to No. 14, Cambridge-road, Mile-end, and boundary walls to vacant land in the rear, for Messrs. Mann, Crossman, & Paulin. Mr. Ernest Shum, architect, No. 14, Great James-street:—

| | |
|---|---|
| T. & T. J. Wood (accepted) | £960 0 0 |

For building four shops, Stratford-road, West Ham, for Messrs. Mann, Crossman, & Paulin. Mr. Ernest Shum, architect:—

| | |
|---|---|
| W. & H. Salmon (accepted) | £1,596 0 0 |

For rebuilding the Nag's Head public-house, Enfield, and shop adjoining, for Messrs. Mann, Crossman, & Paulin. Mr. Ernest Shum, architect. Quantities by Mr. J. G. Raynes:—

| | |
|---|---|
| L. & W. D. Patman | £5,282 0 0 |
| W. & H. Salmon | 4,652 0 0 |
| F. & F. J. Wood | 4,538 0 0 |
| Langmead and Way | 4,489 0 0 |
| Fairhead | 4,000 0 0 |

For the erection of new office and stables at Wright's-lane, Kensington, for Messrs. Charrington, Sells, Dale, & Co. Messrs. Mann & Saunders, architects:—

| | |
|---|---|
| Lucas & Son | £720 0 0 |
| Richards & Son | 589 0 0 |
| Stimpson & Co. | 555 0 0 |

For the erection of four houses and shops in High-street, Kensington, for Mr. W. Stuart. Mr. A. Williams, architect:—

| | |
|---|---|
| Martin, Wells, & Co. | £6,420 0 0 |
| Larter & Son | 6,075 0 0 |
| Patman & Fotheringham | 5,873 0 0 |
| Lucas & Son | 5,837 0 0 |
| Langmead and Way | 5,810 0 0 |
| Bywater | 5,643 0 0 |
| Nash | 5,590 0 0 |
| Craske | 5,475 0 0 |
| Stimpson & Co. | 5,260 0 0 |
| Baker | 5,055 0 0 |

For new Board Room and sundry repairs in the rear of No. 21, Camden-road, for the Aërated Bread Company, Mr. G. Edwards, architect:—

| | |
|---|---|
| Craske | £448 0 0 |
| Niblett | 440 0 0 |
| Stimpson & Co. | 415 0 0 |
| Green | 344 0 0 |

For additions to the Great Western Hotel, Reading, for Mr. W. G. Flanagan. Messrs. Brown & Albury, architects:—

| | | Time required to execute the work. |
|---|---|---|
| Kingerlee | £1,360 | 15 weeks. |
| Strong Bros. | 1,275 | 17 weeks. |
| White | 1,272 | 17 weeks. |
| Higgs* | 1,265 | No time stated. |
| Sheppard | 1,250 | 16 weeks. |

* Accepted to complete in 12 weeks.

For inclosing and laying out new burial ground at Mitcham, Surrey, and erecting mortuary chapel thereon, for the Mitcham Burial Board. Mr. Edwin Chart, architect. Quantities by Messrs. Franklin & Andrews:—

| | |
|---|---|
| Bottoms Bros. | £2,750 0 0 |
| Nightingale | 2,257 0 0 |
| Higgs & Hill | 2,120 0 0 |
| Dickenson | 2,105 0 0 |
| Holloway | 1,978 0 0 |
| Martin, Wells, & Co. | 1,932 0 0 |
| Knight | 1,851 0 0 |
| Cooke & Co. | 1,850 0 0 |
| Tyerman | 1,850 0 0 |
| Fletcher | 1,849 0 0 |
| Hazell | 1,794 0 0 |
| Acock | 1,782 0 0 |
| Maider & Harpur | 1,764 0 0 |
| Crockett (accepted) | 1,761 0 0 |

For the erection of villa residence at Grove Park, Chiswick, for Mr. C. J. Anderson. Mr. A. E. F. Spratt, architect. Quantities supplied:—

| | |
|---|---|
| Whitman | £1,542 0 0 |
| Carless | 1,430 0 0 |
| Nash | 1,370 0 0 |
| Sims | 1,360 0 0 |
| Stimpson & Co. | 2,315 0 0 |
| Hunt | 1,296 0 0 |
| Arundel | 1,275 0 0 |
| Maton | 1,150 0 0 |

For additions and alterations to Hendon Union Workhouse, Edgware. Messrs. H. Saxon Snell & Son, architects:—

| | |
|---|---|
| Nightingale | £20,847 0 0 |
| Mowlem & Co. | 19,500 0 0 |
| Crockett | 18,900 0 0 |
| Adcock, Dover | 18,332 0 0 |
| Wall Bros. | 18,321 0 0 |
| Perry & Co. | 17,831 0 0 |
| B. N. Smith, Birmingham | 17,373 0 0 |
| Bentley, Leicester | 16,968 0 0 |
| Kindell, Harrow | 16,850 0 0 |
| Haynes, Alperton (accepted) | 16,525 0 0 |

For new school buildings and boundaries, for the Ilkeston School Board, Leicester. Mr. J. Tait, architect:—

| | |
|---|---|
| Shaw (accepted) | £3,906 11 4½ |

For new lobbies and arrangements for ventilation at the Wesleyan Chapel, Cotham, Bristol. Mr. Herbert J. Jones, architect:—

| | |
|---|---|
| Church | £162 0 0 |
| Johnson | 153 16 0 |
| Jervis & Edbrooke | 135 0 0 |

For alterations to warehouses, Nelson-street, Bristol, for Mr. F. W. Gedye. Mr. H. J. Jones, architect:—

| | | Allow for Old Materials. |
|---|---|---|
| Church | £1,339 | — |
| Jervis & Edbrooke | 1,148 | £30 |
| Humphries | 1,145 | 47 |
| Barrow | 1,125 | — |
| Hatherley | 1,047 | — |
| Walters | 849 | 30 |
| Johnson | 825 | 25 |

For proposed additions to residence and new stables Sutton Valence, for Mr. J. N. Bredin. Mr. E. W. Stephens, architect:—

| | |
|---|---|
| J. B. Rouse, Sutton Valence | £698 0 0 |
| Simmonds, Maidstone | 655 0 0 |
| Bingham, Headcorn | 626 0 0 |
| Wallis, Maidstone | 624 0 0 |
| Cox, Brothers, Maidstone | 607 10 0 |
| J. C. Brooks, Chart Sutton | 600 0 0 |
| Wood & Sons, Boughton | 578 0 0 |
| Avard, Maidstone | 560 0 0 |
| Maytum, Bros.,* Sutton Valence | 543 0 0 |

* Accepted.

For the erection of twelve workmen's cottages and three shops on the Brook Estate, Edmonton. Mr. F. C. Dyer, architect:—

| | |
|---|---|
| Niblett | £4,150 0 0 |
| Wildman | 3,900 0 0 |
| Brooks | 3,880 0 0 |
| Martin | 3,825 0 0 |
| Balaam Bros. | 3,800 0 0 |
| Hawkings | 3,783 0 0 |
| Burch & Moore | 3,730 0 0 |
| Palmer | 3,700 0 0 |
| Turtle & Appleton | 3,675 0 0 |
| Bowdidge & Burley | 3,600 0 0 |
| Mathin | 3,492 0 0 |
| Childs | 3,300 0 0 |
| Capsey | 3,275 0 0 |
| Everett | 3,255 0 0 |
| Dearsley Bros. | 2,597 0 0 |
| Bartlett | 2,583 0 0 |
| Lyons | 2,325 0 0 |

For sundry works to five houses in Ossulston-street, Somers Town, for Mr. Henry Von Joel. Mr. W. J. Miller, architect:—

| | |
|---|---|
| Adams | £1,015 0 0 |
| Jackson & Todd | 900 0 0 |
| Royle | 866 0 0 |
| Spencer & Co. (accepted) | 810 0 0 |

For alterations at the Capital and Counties Bank, Thread needle-street. Mr. R. King, surveyor. No quantities:—

| | |
|---|---|
| Spencer & Co. | £1,176 0 0 |
| Little | 1,059 0 0 |
| Beale | 1,049 0 0 |
| Panter & Powditch (accepted) | 948 0 0 |

For new Seed Store at the Royal Berks Seed Establishment, Reading, for Messrs. Sutton & Sons. Messrs. Brown & Albury, architects:—

| | |
|---|---|
| Botterill,* Reading | £1,389 0 0 |

* Accepted, to complete in thirteen weeks.

For new Seed-drying House, at the Royal Berks Seed Establishment, Reading, for Messrs. Sutton & Sons. Messrs. Brown & Albury, architects:—

| | |
|---|---|
| Higgs,* Reading | £580 0 0 |

* Accepted, to complete in eight weeks.

For kerbing at Leytonstone and Leyton:—

| | Straight. s. d. | Circular. s. d. |
|---|---|---|
| W. Farrow | 2 5½ | 2 7½ |
| G. Wright | 2 2 | 2 4 |
| Mowlem & Co. | 2 1 | 2 3 |
| F. C. Griffiths | 2 4½ | — |
| Turner & Sons (accepted) | 2 0 | 2 2 |
| Wheeler & Co. | 2 2 | 2 4 |
| D. Knight | 1 11½ | 2 1½ |

For the erection of a detached residence, Trinity-road, Tulse-hill. Mr. W. H. Milnes, architect. Quantities by Mr. Henry Lovegrove:—

| | |
|---|---|
| Maxwell Bros. | £1,969 0 0 |
| C. Goad | 1,829 0 0 |
| J. Taylor | 1,773 0 0 |
| G. Candler | 1,750 0 0 |
| Holliday & Greenwood (accepted) | 1,629 0 0 |
| Stone (too late) | |

For the erection of mission-room, St. Saviour's Church, Herne-hill-road:—

| | |
|---|---|
| W. Downs | £393 0 0 |
| W. Smith | 359 0 0 |
| Holliday & Greenwood | 315 0 0 |
| G. F. Williams | 293 0 0 |
| Jas. Taylor (accepted) | 289 0 0 |

For Park-hill Congregational Church, Nottingham. Messrs. J. Tait & J. Langham, architects:—

| | |
|---|---|
| Merson | £4,712 0 0 |
| Hayes | 4,491 0 0 |
| Jelley | 4,096 14 4½ |
| Slight | 4,011 0 0 |
| Hind | 3,977 10 0 |
| Munks | 3,905 10 0 |
| Stirk | 3,836 19 3 |
| Bell (accepted) | 3,627 9 4 |

For Château at Hyères, France, for Mr. John Sanley Messrs. Wm. G. Habershon & Fawckner, architects:—

| | Francs. |
|---|---|
| Davy, Hyères | 112,851 |
| Wright, Paris | 110,000 |
| Machetti, Hyères | 103,438 |
| Bosquet, Marseilles | 100,700 |

For farm buildings, Wrotham Hill Park, for Mr. Jonathan Rigg. Mr. Geo. Friend, architect:—

| Builder. | Centre Block Complete. | Cart Horse Stables and Harness Room. | New System of Drainage. | Hay and Straw Sheds, &c. | Total. |
|---|---|---|---|---|---|
| E. Vaughan, Maidstone | 1,790 0 0 | £315 0 0 | £384 0 0 | £640 0 0 | £3,029 0 0 |
| Wallis & Clements, Maidstone | 1,740 0 0 | 195 0 0 | 365 0 0 | 600 0 0 | 2,900 0 0 |
| Wheatley, Tonbridge | 1,775 0 0 | 182 10 0 | 335 1 3 | 580 0 0 | 2,872 11 3 |
| Calland & Son, Rochester | 1,450 0 0 | 125 0 0 | 370 0 0 | 470 0 0 | 2,415 0 0 |
| Harryman, Lewisham | 1,076 0 0 | 177 0 0 | 378 0 0 | 769 0 0 | 2,400 0 0 |
| Wood, Boughton, Winchelsea (accepted) | 1,387 0 0 | 90 0 0 | 313 0 0 | 529 0 0 | 2,319 0 0 |

For public baths and buildings at Kettering, Northamptonshire, for the Kettering Bath Company, Limited. Mr. R. W. Johnson architect. Quantities supplied:—

| | |
|---|---|
| Farrell | £1,762 0 0 |
| C. F. Henson | 1,448 0 0 |
| Coates & Son | 1,400 0 0 |
| Ireson | 1,342 0 0 |
| Manby | 1,333 0 0 |
| Payne & Son | 1,305 0 0 |
| S. V. Henson | 1,294 0 0 |
| Barlow | 1,195 0 0 |

For new schools at Rushden, Higham Ferrers, Northamptonshire. Mr. Sharman, architect. Quantities supplied:—

| | |
|---|---|
| Smith & Son, Raunds | £831 0 0 |
| Green, Wellingboro' | 823 0 0 |
| Foskett, Rushden | 791 0 0 |
| Cooper & Co., Wollaston | 752 0 0 |
| Moore, Rushden | 742 0 0 |
| Bayes, Rushden | 702 0 0 |
| Stevens, Rushden | 692 0 0 |

For additions and alterations to Hendon Union Workhouse, Hendon. Messrs. Saxon Snell & Son, architects:—

| | |
|---|---|
| Nightingale | £20,847 0 0 |
| Mowlem & Co. | 19,500 0 0 |
| Crockett | 18,900 0 0 |
| Adcock, Dover | 18,332 0 0 |
| Wall Bros. | 18,321 0 0 |
| Perry & Co. | 17,831 0 0 |
| B. N. Smith, Birmingham | 17,373 0 0 |
| Bently, Leicester | 16,968 0 0 |
| Kindell, Harrow | 16,850 0 0 |
| Haynes, Alperton (accepted) | 16,525 0 0 |

For St. Paul's Mission Hall, Carlisle:—

| | |
|---|---|
| T. Scott, Carlisle | £1,030 14 0 |
| J. & W. Laing, Carlisle | 1,000 0 0 |
| G. Hill, Carlisle | 975 0 0 |
| J. Reed, Carlisle | 957 0 0 |
| C. & J. Armstrong, Carlisle | 938 0 0 |
| Wm. Court, Carlisle | 927 0 0 |
| H. & R. Court, Carlisle | 917 8 0 |
| Batey and Forster, Carlisle | 908 0 0 |
| Holliday & Black, Carlisle | 898 0 0 |
| Geo. Black, Carlisle (accepted) | 873 18 0 |

For levelling, forming, and sodding proposed recreation ground for the Barmouth Improvement Committee. Mr. Thomas Roberts, C.E.

| | |
|---|---|
| Powell, Barmouth | £250 0 0 |
| Williams, Harlech | 230 0 0 |
| Owen, Portmadoc | 200 0 0 |
| G. Williams, Harlech | 182 16 0 |
| Morgan, Dolgelley | 165 0 0 |
| Thomas & Davies, Barmouth (accepted) | 150 0 0 |

For the erection of a villa residence at Honor Oak, for Mr. E. P. Trenchard. Mr. W. H. Jervis, architect:—

| | |
|---|---|
| Newman | £1,245 0 0 |
| Bridel | 1,160 0 0 |
| Holloway | 1,137 0 0 |
| Avis & Son | 1,125 0 0 |
| A. & F. Smith | 1,125 0 0 |
| Redman (accepted) | 1,075 0 0 |
| Sly (withdrawn) | 895 0 0 |

For new Baptist Chapel, Grafton-square, Clapham. Mr. W. Niven, architect. Quantities by Messrs. Goodchild & Son:—

| | |
|---|---|
| Dove Bros. | £6,475 0 0 |
| Patrick & Son | 6,290 0 0 |
| Smith & Sons | 6,059 0 0 |
| McLachlan & Son | 5,980 0 0 |
| Rider & Son | 5,948 0 0 |
| Adamson | 5,873 0 0 |
| Nightingale | 5,787 0 0 |
| Higgs & Hill | 5,784 0 0 |
| Colls & Sons | 5,745 0 0 |
| F. Higgs | 5,572 0 0 |

For pulling down and rebuilding three shops, 222 to 224, City-road, N., for Messrs. Roy & Cartwright. Mr. Geo. Treacher, architect:—

| | |
|---|---|
| Conland | £3,496 0 0 |
| J. Beale | 2,993 0 0 |
| Gibbs & Flew | 2,700 0 0 |
| Smith (accepted) | 2,395 0 0 |

For alterations and additions to the Capital and Counties Bank, Threadneedle-street, City. Mr. R. King, architect. No quantities:—

| | |
|---|---|
| Spencer | £1,176 0 0 |
| Little | 1,059 0 0 |
| J. Beale | 1,049 0 0 |
| Panter & Powditch | 948 0 0 |

For the erection of St. Luke's Church and Schools, Reading. Mr. Jas. P. St. Aubyn, architect. Quantities supplied by Messrs. J. & A. E. Bull:—

| | |
|---|---|
| H. Higgs, Reading | £9,892 0 0 |
| Patman & Fotheringham, London | 9,879 0 0 |
| Kimberley, Banbury | 9,878 0 0 |
| Woodroffe, Reading | 9,650 0 0 |
| Searle, Reading | 8,960 0 0 |
| Parnell, Rugby | 8,535 0 0 |
| Silver, Maidenhead | 8,420 0 0 |
| Botterill, Reading | 8,367 0 0 |

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